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Original Contributions.

EXTENSION OF CAVITIES.

By C. P. WOOD, D.D.S., DETROIT, MICH. READ BEFORE MICHIGAN DENTAL ASSOCIATION, AT PORT HURON, JULY 11-13, 1899.

When we consider that the restoration of the natural organs of mastication has almost entirely supplanted the custom of extraction and the making of plates, and that upon the extension of the cavity depends the life and permanency of an organ so vitally related to the nourishment of the body, we will admit that the subject deserves our careful attention at all times.

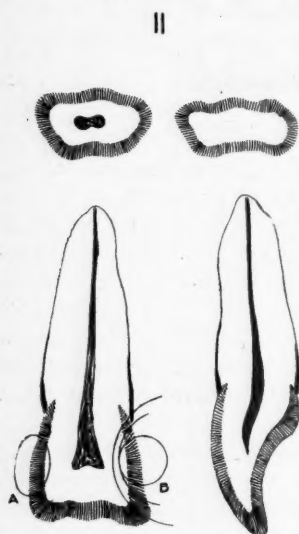


The entire aim in extension of cavities is to relieve the teeth so far as possible of all conditions that invited and made decay possible in the first place, and to put them in such a condition as to render the agents of decay impenetrable. I believe that the dentist, by careful attention to his art, may in many cases place a tooth in better condition to resist decay than that which existed by nature.

Extension for prevention must be regulated to some extent by the age of patient and structure of tooth, as some teeth, especially after middle age, seem to be decay proof, and in others, do what we may, the ravages continue. In order to work with any accuracy of purpose, we must have a thorough knowledge of tooth forms. The natural form must by all means be preserved or restored, for upon this point the permanence and usefulness of our work largely depends. We should know from practical experience, as well as from the histologist's point of view,

the relations of enamel, dentin, cementum and pulp. Diagram 1 shows them, and especially the natural enamel cleavage.

In this specimen, which is typical of all cavity formation on any

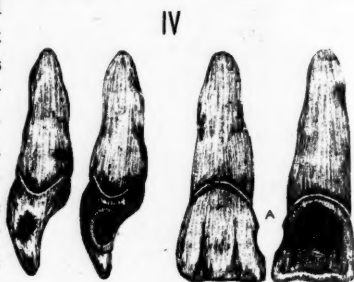


part of the tooth, decay has gone through the enamel and spread out between it and the dentin for a considerable distance, leaving the enamel unsupported; and the cement substance, which holds the rods together as a life force, is dissolved out by the acids of decay, according to the deeper black lines. We must cut away to a point where dental ends of rods will be supported by sound dentin, in order that the process of decay may not continue after the filling has been inserted. If we leave this undermined portion of enamel, though it appears solid and healthy on external surface, we are sure



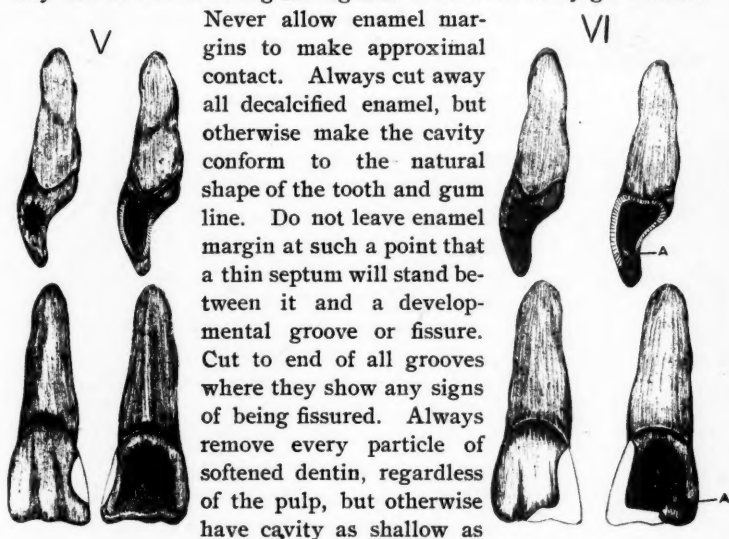
to have at least a bad discoloration, and generally a leak and further decay. From our work at the chair we acquire a fair understanding of the direction of enamel

rods on all parts of the teeth, but Diagram 2 will serve to impress upon our minds more distinctly the lines of their natural cleavage. They radiate nearly in a perpendicular line from the surface of the dentin, and as the cement substance is less strong than the rods, cutting will be more easily done in this direction. The enamel is always thickened at the cusps and at all ridges and angles, as shown in 1 and 2, and we can rely upon greater strength for our margins at these points than elsewhere.



These diagrams show that by neglecting to bevel margins we leave some short ends of rods not supported by dentin, which under the least stress will break down. Making deep grooves under the enamel margin brings about the same condition.

As a paper of this character would not be complete without some working rules, I state the following observations from practice: First, secure ample space to move in. Form all enamel margins so that they will present no short ends of rods, and place them where they will be self-cleansing throughout or be covered by gum tissue.



Never allow enamel margins to make approximal contact. Always cut away all decalcified enamel, but otherwise make the cavity conform to the natural shape of the tooth and gum line. Do not leave enamel margin at such a point that a thin septum will stand between it and a developmental groove or fissure. Cut to end of all grooves where they show any signs of being fissured. Always remove every particle of softened dentin, regardless of the pulp, but otherwise have cavity as shallow as

possible commensurate with sufficient strength to filling material. A valuable consideration to keep in mind is, that the farther we extend the margin of near contact in all directions from the point of contact the less the liability to further decay. Plenty of time is of vital importance; we must not figure on just so much time for each operation. Begin each cavity feeling that you have all the time there is and work as though your reputation was at stake. Use a good sharp bur all the time, and if you get tired or patient objects too much, don't say "I guess that will do," but close up the cavity temporarily and finish at a subsequent sitting.

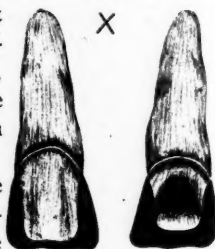
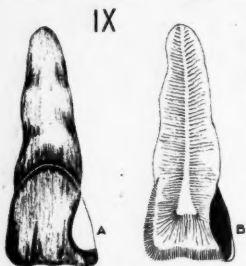
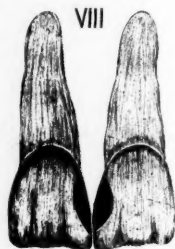
We must have good separation, if we would shape our cavity correctly, properly finish margins, and have in finished work the normal shape of tooth restored. To get this space in most cases, especially in the posterior teeth, requires from three days to two weeks and sometimes more. I believe the most satisfactory results are obtained for both patient and operator when we open cavity at first sitting, remove all softened structure, pack with gutta-percha or cotton, and allow it to remain until we get the proper separation. This method puts the

gum tissue easily out of reach of our instruments, and when finished the tooth assumes its normal position close up to adjacent member, and we avoid the possibility of the patient coming back to complain that the gum septum is always sore, due to the crowding of food between the teeth. The six anterior teeth

will receive our attention first. Occasionally a cavity is found in these teeth which should not be brought to exposed surfaces, and should be left just as small as possible, except to get good firm margins, as in Diagram 3. But unless the point of decay is very much circumscribed, extend to self-cleansing surfaces in every case, as in Diagrams 4 and 5. We should not hesitate in such cases to cut

straight through labial and lingual wall, put the cervical margin under the gum, and margin toward cutting edge below contact point, or round out filling so that contact will come upon it away from the enamel margin, as in Diagram 8.

I believe we come far short of making the best fillings if we do not cut through the lingual wall in such cases, and on account of the greater slope to the proximal surface on lingual side, cutting through to the slightest degree answers the purpose of self-cleans-

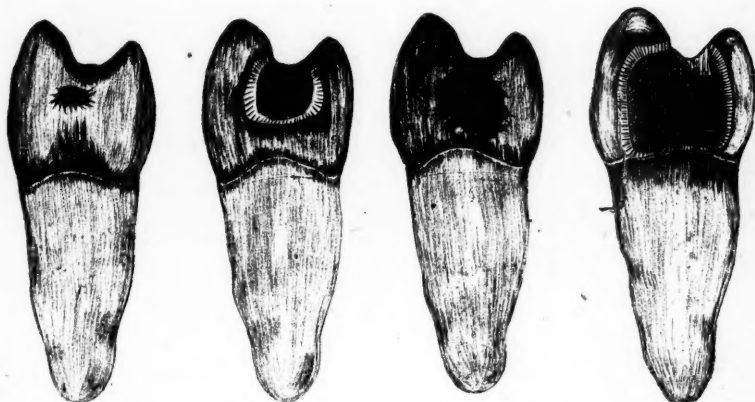


ing margins and keeps the enamel marginal edges apart, as Diagram 4. We should extend the cavity labially so that the filling will present well-marked lines, for experience has shown that it is better to have filling show up boldly than to present lines which look like a cavity on account of shadow cast by adjacent tooth.

Marginal line of cavity should form accurate, graceful curves, and conform to the elliptical form rather than the full circle, as in diagram 2-A rather than B. By paying special attention to this

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XII



point we follow more closely the direction of enamel rods and thereby secure greater strength to finished work. Never form cavity so as to have an abrupt curve near cutting edge, as in Diagram 9-A, but slope down gradually, as in 9-B. Make inside wall of natural retaining shape, presenting angles rather than curves.

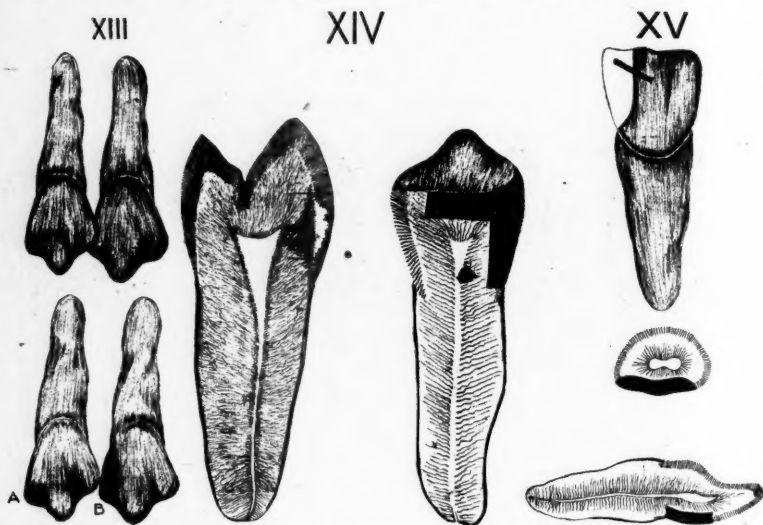
Make special anchorage entirely in cervical third or half, grooving slightly cervically, labially and lingually. Never make pits near the cutting edge in such cavities. Bevel of margin should be nearly always at a right angle to wall of cavity.

When two cavities like the foregoing come together in adjoining teeth, both for better harmony and also to avoid enamel margins

coming together, make of slightly different shapes and extend one farther than the other, as in Diagram 8.

There is no class of cavities so difficult of successful manipulation for most of us as those which come so close to the cutting edge as to endanger the breaking down of the corner after filling has been inserted, or those where the same has already broken down.

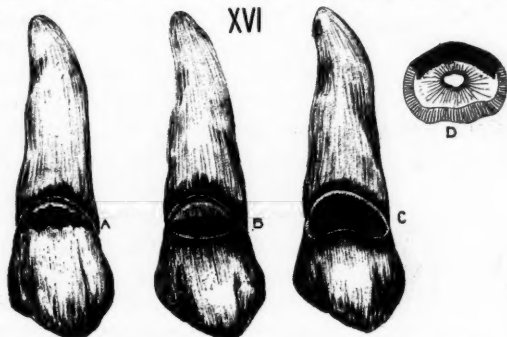
There can be no set rule for cavity formation in any part of the mouth, and especially not here. The operator must use his best judgment with case at hand. As stated before, the age, tempera-



ment, structure of tooth, direction and force of bite, and many other things will determine whether we leave corner, cut off and build to full contour, or restore only in part. We might build a full corner on a good strong tooth, thinking we had reached the very acme of perfection, and have it come back in a year battered out of recognition because of a heavy bite. And again we may adapt a similar filling to a tooth of medium structure, and with malocclusion or weak bite have it stand perfectly. Diagram 6 will show the form of extension that seems to be best adapted to cases where we make any attempt at restoring a corner, especially when extensive proximal decay has taken place. First we cut away labial plate of

enamel at cutting edge just enough to have it well supported by dentin, and allow sufficient thickness of gold to withstand the bite. Cut lingual plate down considerably farther than labial, extending fully two-thirds across cutting edge. Make a distinct step at this point, Diagram 6-A, between enamel plates at right angles with proximal part of cavity. Extend cavity cervically to a point usually in the cementum, making as broad and flat a base as possible, and countersink or groove slightly cervically, labially and lingually. The step is deepened and countersunk with small inverted-cone bur through its entire length. With proper adaptation and condensing of gold this style of cavity will stand the test.

When two cavities of this order come together, to make them less conspicuous we should try by sloping down gradually, narrowing



slightly, rounding off corner and easing up on the bite, to avoid cutting off corner of one or the other, as in Diagram 7.

When both distal and mesial corners of same tooth require restoration, one continuous filling should be made, as in Diagram 10. This makes a very strong filling and in most instances is better than a crown.

The cuspid being the keystone of the arch of the mouth, is the most important with which we have to deal. The considerations are so numerous that I will say only that we should avoid, by all manner of means, disfiguring the face. However, if we do have to extend cavity to the face of the tooth we should be extremely accurate in restoring in every detail the normal shape and contour.

The next in line of importance and, I may say, most important so far as strength and durability of our work and conservation of tooth

structure is concerned, are superior bicuspids. For on account of their shape and relation to lower teeth they get harder usage than any others. The proximal cavity is the only one to be considered at this point, and only in cases where there is no proximal contact should we attempt to fill the same without extending to the grinding surface, as in Diagram 11. I would rather not fill such cavities at all than to fill without extending to self-cleansing surface, and anchoring in the grinding surface; and I think we should extend and fill in every case, anticipating decay of adjacent tooth.

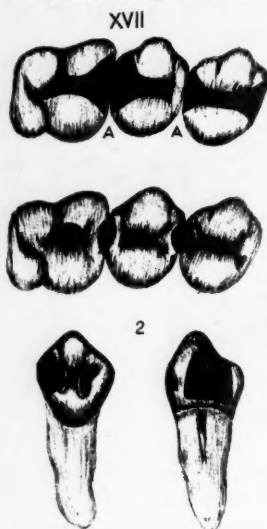


Diagram 12 shows what may be called an extreme case, but it will answer our purpose. The grinding surface must be broken through and lateral walls extended to a line approximating the buccal and lingual occlusal angles, and in extreme cases, such as this one, to the buccal groove, as shown in Diagram 13. The lateral walls should diverge outwards as they near the cervical base, to make them correspond to the shape of tooth, to place in best position for self-cleansing, and to give a broad base to cavity. The cervical wall should be carried well under the gum in the average case, and when the original cavity approximates the cementum, extend into it.

I never feel so secure as when the base of filling is seated in the cementum, and have never seen a filling that had given out distinctly at cervical portion when seated at this point. It usually gives out lingually or buccally, not having been extended far enough. The anchorage is made principally in the grinding surface by cutting out entirely the triangular and central grooves, extending just through the enamel or to the bottom of the average fissure, as in Diagram 14. This makes a distinct step at right angles to body of filling, which affords sufficient anchorage, save square-cut angular inner walls. Base of cavity should be countersunk slightly pulpally, as in diagram. By this method we avoid the necessity of half-killing our patient by making retaining grooves in the most

sensitive part of the tooth. When finished with shaping, the last and very important part is to thoroughly smooth and bevel margins. This may be done with small stones, large rose bur, chisels, obtuse hoe excavators, or anything that is perfectly inflexible. The bevel of margin should increase directly in proportion to the size of cavity, reaching a right angle in large cavities, the same as in the front teeth. The appearance of finished work in these cases will be as in Diagrams 13-A and B and 17-A.

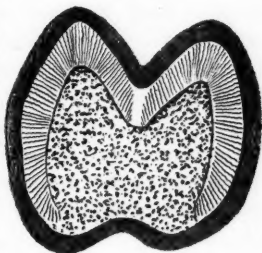
Proximal cavities in all other posterior teeth, except inferior first bicuspid, may be treated in the same manner. The inferior first bicuspid has such a marked sloping cusp and grinding surface, serving more as a cusp than a bicuspid, and has the transverse ridge so thick and prominent in most cases, that we should not try to form a step, but allow the grooves in lateral walls to suffice for anchorage, as in Diagram 17-2.

For extension of crown cavities in bicuspid and molars I show diagrams to correspond to rules given, that we must cut out all fissured grooves. Diagram 18 represents the developing tooth, bringing out especially the enamel of a bicuspid or molar, showing a lack of union between the two cusps. This condition, as in Diagram 18-2,

exists in the majority of mature teeth; in fact in a great many that we do not detect with the naked eye or without rubber-dam in place. We see by Diagram 1 that there is no need, so far as avoiding short ends of enamel rods, of beveling margins in crown cavities. Make square-cut walls throughout with fissure drill, and avoid any lapping of filling material upon surface of enamel.

There is no class of cavities so dreaded as the cervical, but with recent appliances and obtundents they become the easiest to restore. Generally the margin should be extended to correspond to gum line and well under it, and beveled slightly. Cavity should be of equal depth and flat bottom throughout, as in Diagram 16-A.

XVIII



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Make no undercuts or pits, but for retention countersink slightly with inverted cone bur the entire circumference. Frequently we find V-shaped cuts across labial and buccal cervical portions of the teeth, as clean and smooth as though a file had been the cause, Diagram 16-B. Apparently the enamel margin is in good condition to build our gold upon without any further preparation, but there exists such a knife edge that a good margin to gold cannot be secured upon it. Accordingly we should prepare just the same as in the other cervical cavities, as in Diagram 16-C and D.

The lines here presented for extension of cavities may appear like a reckless waste of tooth structure, but in my short experience I have yet to know of one case where I have experienced regret for having extended margins too far, but the realization of having extended too little comes to me not infrequently.

As I have indicated before, there can be no successful practice of dentistry based upon arbitrary rules and formulæ; a high ideal and carefully thought out theory of how to treat each case is imperative. We should use every means within our reach to gain such a general knowledge of the teeth and jaws, in their normal and pathological conditions, that we may with ease, upon thorough examination of any case, apply the method and kind of work best adapted to it. Don't go at every case as though it must have the same treatment as the preceding one.

In giving this paper I first made the drawings to bring out ideas and methods used in my own practice, then did my best to write something of profit, and if you do not agree with me, let free discussion have its perfect work and I shall be satisfied.

Discussion. Dr. W. A. Dorland: Fill the teeth so that each may have its natural contour. I believe in cutting away a little too much sound structure rather than too little. Nature designed the teeth to support each other and to protect the gum, but if their natural shape is destroyed they can not do so.

Dr. J. L. Young: If we have the teeth in absolute contact it is certainly impossible for microbes to work at the point of contact. I believe that the inception of decay is not there, but slightly above, where particles of food will lodge and not be kept clean. Where we fail to restore the point of contact, when it has been removed by decay, we allow a space for food to get in.

Dr. Isaac Douglass: I would like to speak of the importance

of the interdental space. Fifty years ago the only way to separate the teeth was to run a file between them, and this left a V-shaped space. One of my first patients was a lady who had the lower bicus-pids separated in that way three years before. She complained of sensitiveness in these teeth, and I found them decaying next to the gum. The only way I could get at the cavities was to use the same kind of a file and separate again. I filled them with amalgam and tin. Five years after these teeth were again decaying at the same place, and I had to run a file through again. By this time they were almost to a point at the ends. I filled them with tin, but soon they decayed. After the introduction of cohesive gold I built those teeth out to their natural form before decay set in, and she has them to-day with the same gold fillings in place.

Prof. J. A. Watling: I always advise space and fully coincide in the use of the Perry separator. I believe in giving Dr. Black all due credit, but think his authorship of the practice of "extension for preservation" is overdrawn, for Dr. Wm. Atkinson did much hard work in that line. The gold is the only thing that should come in contact with the teeth after they are filled, for when two broad, flat surfaces come together they will assuredly decay sooner or later. I never had much success with the use of a retaining-screw, so depend more on shaping the cavity and perfect adaptation of the gold to the tooth. Many speak of decay taking place around the gold and the lateral borders, but if it is properly adapted there is no more danger there than at the cervical margin, but it is more difficult to secure perfect adaptation.

Dr. J. N. Crouse: I do not believe in cutting through the lingual surfaces of the front teeth. Arthur's treatise on "Prevention of Decay," in which he advises cutting teeth with the file, did a great deal of harm, almost as much as the "New Departure." There is one thing in his method which I have used successfully for many years on incisor teeth. Where there is a small cavity which has not gone far enough to reach sensitive dentin I leave the enamel in contact, and many teeth treated this way have stood for twenty-five years. In a woman's mouth, where appearance is of importance, I would never cut through labio-lingually and let the gold show. Many cases do not require such procedure, for even though the walls be thin they will stand for years. Extension for prevention is apt to be carried to extremes, especially in children's mouths.

Many teeth twenty years old are immune from decay and previous extension in such cases would have been folly. Many times great harm is done with the disk and strip, and I would advocate cutting the gold off at the cervical margin. Using the disk at the cervical margin on the sensitive dentin and peridental membrane will leave the tooth sensitive afterwards.

Dr. J. A. Taft: From the paper we would infer that there is entire uniformity in the condition of teeth, but they differ throughout life. The force of mastication is something else that must be considered. Some fillings have no displacing force brought on them, but proximal fillings, as shown in some of these cuts, often are subjected to enough force to dislodge and press them out. Where there is no doubt as to permanency of anchorage, make the filling a little short of actual contact. The difference in the structure of teeth has been referred to. Some offer more resistance to the cutting instruments than others, because of their substance, and this pertains to the enamel and dentin as well. The strong teeth should not be cut so much as the frail ones.

Dr. Wood: The danger in forming the cervical cavity is that we cut it out easily, and the tendency is to leave the edges too sharp. Men of long experience have the right to say it is bad practice to cut through the lingual and labial walls of the incisors, and I would not do it in every case, but it has often been a great satisfaction to me.

IDEALISM IN DENTISTRY, OR THE DENTAL EPOCH.

By H. T. HARVEY, D.D.S., BATTLE CREEK, MICH. READ BEFORE THE MICHIGAN DENTAL ASSOCIATION, AT PORT HURON, JULY 11-13, 1899.

It is not the intent of the writer to definitely discuss the moral standard of the dental profession, it being granted that all possess the moral instinct and prefer right to wrong. The debt that every man owes his profession, and is obliged to pay if he wins marked success in it, is the mastery of its great principles as they are unfolded to him. Every increase of power we have gained by our acquisition of knowledge increases our debt to other men.

The dominant aim of our lives is not to be gratification of ambition, or the acquisition of wealth, power or fame, but the rendering of service to our fellow men. What good to the world are we as men? Just so much as we can render in service to the world.

What good is the world to us? Just that much that we can get from it. How many of us are willing to admit that the world can do without us?

What good are we to the dental profession or it to us? If we are to live in the dental sphere, why not do so with a high ideal, with a noble purpose, yes, even as true philanthropists. How much more noble are the purposes and how much more grand are the results of one who is not all self-esteem. I would rather die a pauper and know that my life had been truly and honestly devoted to the thousands of trusting patients who had reposed implicit confidence in me, than to live in all the luxurious magnificence that wealth and fame brings, without that beautiful tribute. True dentists are philanthropists; true dentistry is philanthropy.

I challenge any one of you to show where it is a loss to be honorable, to be charitable, to be kind and lenient. I have personally achieved more real benefit and satisfaction from the class of patrons that are commonly termed *charitables* than from any other source. Into the hands of every individual is given a marvelous power for good or evil, and the extent is measured only by the degree of influence of the individual. The unconscious influence—the silent, subtle radiation of his personality, the effect of his words and acts, the trifles he never considers—is tremendous. Every moment of life he is changing to a degree the life of the whole world. Each man has an atmosphere which is affecting every other. Every one in merely living is radiating sympathy or sorrow, happiness or hope.

To make our influence felt we must be what we pretend. We must practice what we believe. No man can isolate himself to evade the responsibility of influence, and no individual is so insignificant as to be without influence. What is the influence of this professional body? How high a test will we stand when placed before the critical view of the world. When weighed in the balance will none be found wanting? Will we truly prove to be ideal representatives of this noble profession? What influence do we exert at home? Are we what the community in which we live take us to be? Have we any regret because we are dentists? Has the profession any cause to hide its head in shame because you are a member thereof? Have you brought reproach upon your profession? Have you a high ideal; if so, have you placed the same in execution? Are you a factor for good and a credit to your col-

leagues in the community in which you live, or have you placed your basis of professionalism upon pecuniary considerations and acquired the reputation for such. If so your ideal is not very high, and you not only bring reproach upon yourself, but upon your profession; and you do not meet it's or the moral code.

Is it permissible for us to seek only to repair the superficial wastes and make no effort to avoid the serious results of disease and decay? When is the memorable time in the history of the dental profession? When do we reach the epoch? When if not now will the dental profession inaugurate that ideal and heroic system of treatment of prevention as a substitute for restoration? Why not now prescribe for the eradication of the causes of disease rather than to sit silently by and await the results of decay? Are we philanthropists when our skill is sought; do we advise truly that which will prevent, or do we merely treat disease as it comes to us, glad of the opportunity, not once realizing how preeminently professional and manly it would have been to advise for the correction of the evil habits of life, which only destroy and never build up? How supremely satisfactory it should be for us to prescribe for our patients that which will nourish and maintain healthy tooth structure, and will bring to the whole man that vital force of life which only is the true insignia for health.

The world is waking up to the fact that something is radically wrong, while the dental profession with others are feeding them on the sophistry that the teeth, the morals and the world are growing better. The human race is on the high road to degeneracy, and it is folly of the worst type to think that the dental organs would be the only salvage of the wreck. The medical profession as well as the world at large are casting glances at the dietary problem for relief. The people must be helped; the fetters of false ways, evil habits and depraved tastes are tightening about them, producing a demoralizing condition.

The people will soon demand of us a more palpable cause for the destruction of their teeth than heretofore advanced. As they become educated they will strive to retain their organs of mastication, realizing the whole bodily health is mainly dependent upon their ability to fulfill their function. Can we do it if we are satisfied with our realm of blissful ignorance?

In closing let me sound a simple word of warning: "As man

eats, so is he. As man thinks, so is he." Poor clay will make a poor brick, even so will poor food make poor teeth. Teeth consist of what they are fed and nothing else. "Constitutional Deterioration" is my theme, and is the cause of all disaffections, the correction and remedy of which make a well body and keep the whole body well. What makes good teeth and maintains good health is a pure natural diet, wholesome and abundant with high nutritive values. Proper combinations of vigorous exercise and pure air, water and rest. Until we adopt a more rational system of living we may expect a demoralized condition in society. And to all thoughtful minds who have sincerely sought the solution to the problem of the day this is one and the greatest cause for the great increase of crime, paupers and insane. Is the dental profession our ideal? If so, is it performing its ideal function? Are the results satisfactory?

Discussion. *Dr. E. T. Loeffler:* The position of to-day would be an ideal for the profession fifty years ago; what sort of an ideal shall we put up for the future? The world is really growing better in a professional way, for the dentists of to-day excel those of ten years ago. If the educational side of our profession is advanced to the proper standard, that is probably the only ideal we can set up for ourselves.

Dr. J. Taft: The title of this paper is hardly correct—dentistry according to whose ideal? Are ideals anything like uniform? We reckon on the future only by the past, and that is a very uncertain way of estimation. No one fifty years ago could have foretold or even conceived that such attainments would be reached in the physical world. We cannot set any standard of excellence that will be realized to the letter. What is to be gained by setting a standard so high that it never can be reached? A great many such ideals have been indulged in the past without a semblance of realization, and what is the result? Let us aim at the practical and not at the impracticable, for many times the unexpected happens and high standards are never realized. Let us do each day's task in the most perfect manner possible, and the highest good will thus be achieved, especially if we utilize all the knowledge which we have, and I think this is not always done.

Dr. Isaac Douglass: I have the highest respect for Dr. Taft, yet cannot agree with him. In the Bible we read "Be perfect, as

your Father which is in Heaven is perfect." That is higher than anyone of us expects to attain, yet we are aiming at such a standard. Let us do each day a little better than we did the day before.

CLEFT PALATE: A CASE IN PRACTICE.

BY E. T. LOEFFLER, D.D.S., SAGINAW, MICH. READ BEFORE THE MICHIGAN DENTAL ASSOCIATION, AT PORT HURON, JULY 11-13, 1899.

Careful observations extending over more than half a century by some of the leading men in the profession have clearly demonstrated that there is absolutely no necessity for any interference in congenital cleft-palate, unless it be done for the purpose of correcting the defective speech. Both surgery and mechanism have been used in the treatment of these defects, but surgery, even under the advantage of the most skillful, up to the present time at least has sadly disappointed expectations. Mechanism with all of its objectionable features has produced the best results. All the various appliances that are used for this purpose are classed under two distinct heads—flexible and elastic, or rigid and non-elastic.

Specialists who have had a long experience in making such instruments, and have carefully noticed the effects of both kinds in practical cases, positively affirm that neither is the best in all cases. In the hands of those who have had a thorough training in this kind of work the flexible instrument is perhaps the more desirable for acquiring articulation, and were it not on account of its perishable nature it should always be the one preferred.

To the inexperienced no description can be given to indicate what sort of an apparatus should be used. Not even a careful study of models or of the remainder of the palate and upper part of the pharynx can always be relied upon as a sufficient guide. With an experience of more than thirty years, and an observation of more than a thousand cases, one eminent authority has failed to discover all the causes which are in force in defective speech from this source.

Our patient, a bright young man, seventeen years of age, is suffering from what is generally termed a congenital cleft of the palate, and in my first conversation with him he expressed an earnest desire to obtain some treatment that would in a measure at least relieve him of what had been a source of considerable annoyance. After a thorough examination I explained to him the method of treatment and what would be the probable outcome. With practi-

cally no experience in this kind of work I fortunately secured the assistance of Dr. W. P. Morgan, who had the necessary skill.

We found upon close examination of our case a wedge-shaped cleft about two inches long, extending well into the hard palate, and nearly an inch wide at its widest portion. The soft palate, divided uvula, and all adjacent parts were in a highly sensitive condition, so that it was with great difficulty that we could obtain simply an ordinary impression even after the parts had been thoroughly sprayed with a solution of cocain.

Those who have had even a limited experience in taking ordinary impressions with plaster of paris know what it means to do this work when all the parts are in a highly sensitive condition. In all cleft-palate cases these difficulties are all greatly increased. The method of taking an impression with an extended tray is well enough understood, yet certain precautions must be strictly observed to guarantee success. No special impression tray is necessary. The ordinary cup for full upper jaw, uniform pattern and well adapted in size and form to cover all the teeth, has been found after repeated experiments of every conceivable variety to be the most desirable. In no case should the tray be too large; but simply to rest against the teeth without any rocking. The apron of gutta-percha should extend just to the lower edge of the divided uvula, but never should it be allowed to come in contact with any of the soft tissues. Last but not least, before any plaster has been introduced carefully observe the position of the tray in the mouth, and see that the uvula in its relaxed condition does not touch any part of the apron.

We finally succeeded in obtaining a fairly good impression, and from this was constructed a thin rubber plate, letting it extend well into the pharynx and bridging the cleft. This plate was worn about three months and we then found conditions very much improved. The hypersensitiveness previously referred to had largely disappeared; the parts had become accustomed to the presence of a foreign body; in fact, the temporary appliance had in every respect fulfilled the mission for which it was intended.

I made a second appointment with my patient to obtain if possible more accurate impressions of the cleft and all other parts necessary for making another plate and a velum. Having prepared my tray and apron of gutta-percha attached, also a V-shaped tray

with handle attached for obtaining an impression of the parts above and adjacent to the cleft, I proceeded. After a half dozen trials I succeeded in obtaining a fairly good impression of the territory above the cleft. Leaving this portion in position and fastening it with threads to the teeth at the side, I thoroughly oiled the lower part of the plaster and proceeded to obtain the lower impression. In taking it I was very careful to carry out the instruction that the soft palate and remnants of the divided uvula should be in their normal position, and therefore shaped the gutta-percha apron on my tray accordingly. Three attempts were necessary before I was successful in getting a good impression. Fitting together these two impressions just taken, and building on wax above to represent the pharyngeal space, I managed to obtain two good models, and from a third impression I obtained a model for making the plate proper. This plate, constructed of hard rubber in the usual way, was provided with two gold clasps passing between the second bicuspid and first molars. From the larger model I constructed a small model of the movable part of the apparatus or velum. For the first one I used gutta-percha and for the second one wax. These models were invested in the usual way and a velum of hard rubber constructed.

The process of fitting the velum to the plate, making hinge and spring, and finally adjusting it to the mouth, must be observed personally in order to be appreciated, and without which it cannot be clearly understood. You can hardly imagine the amount of "cutting and trying" there is necessary to do this kind of work. This apparatus when completed was worn about three months, and during that time a gradual improvement in articulation was quite noticeable, although in the beginning the patient did not seem to realize any marked advantage.

In the meantime I carefully studied the action of the soft palate, uvula and palato-pharyngeal muscles in different mouths, but these observations, even with an experienced eye, are quite limited and to a certain extent unreliable. Then I began a similar course of study of my patient's mouth, taking particular pains to notice the action of the muscles in question when certain forces were brought to bear upon them. In fact I made every possible effort to find out just how to shape a velum that would give more satisfactory results than the one I had already made. New impressions were taken and

new apparatus constructed, similar to the old one except in minor details.

I purposely made the patient go without the apparatus for a week, and when he came back to have the new one fitted in its place he said "he felt lost without it and his friends could not understand him." The importance of what we were doing for him was now quite manifest and that was the point I wished to make.

Thus far nothing has been said in regard to instructions given and their importance. The possession of any apparatus, no matter how skillfully adjusted to the needs of a given case, will by no means transform him immediately into a good speaker, any more than would the possession of a violin or piano transform the possessor into a master of that instrument. Every time my patient came to the office I spent some time drilling him in uttering correctly the various word sounds, by having him read aloud, and also emphasized the imperative need of such instruction at regular intervals. It is only an imposition to these patients to encourage them in the belief that they can learn to articulate properly by simply wearing an instrument. This would probably do if it could be applied in infancy, but such cases as these come to us generally when this stage is passed and the bad habits of speech have become almost fixed. All the muscles utilized in the mechanism of speech have acquired improper actions in their effort to make up for this deficiency, and so we can readily see that the majority of these people are handicapped in a way by bad habits of articulation, which must be unlearned before any actual progress can be realized. It is estimated that not one person in ten wearing an artificial palate, who has passed the age of childhood, will ever attain such proficiency in articulation that he does not betray his defect. There may be some phenomenal cases on record in which patients of mature age under proper instruction and with perseverance have attained a high degree of perfection, but they are rare.

Some claim that much depends upon the kind of instrument used. Dr. Kingsley advocates a velum of flexible rubber in the beginning, because patients learn to articulate more rapidly, and later on this can be replaced by one of hard rubber.

Acting upon this advice I constructed a facsimile of the hard rubber velum, making the part that comes in contact with the wall of the pharynx of flexible rubber. I simply made a mold of it in

plaster of paris, and on that account the soft part did not come out so smoothly as might be desired. However, I put this newly constructed velum in place of the old one and let him wear it a short time as a matter of trial. The process of constructing a mold of type-metal for making duplicates of the soft velum is, in at least some respects, a very difficult and trying piece of work. After a number of trials I succeeded in making a fairly good mold in type-metal, and from this I made another velum like the previous one, the part coming in contact with the wall of the pharynx being of flexible rubber. In adjusting the first velum of flexible rubber to the plate I failed to allow sufficient space between it and the wall of the pharynx, and the result was an ugly sore in the soft tissue of the superior constrictor muscle. The treatment has by no means been completed, and my intention is to continue until more satisfactory results are obtained.

Discussion. *Dr. J. Taft:* In view of the difficulties attendant upon such cases and of their infrequency, it is a question whether the time bestowed by students in learning this operation could not be better employed in other things, and let it be relegated to specialists.

Dr. C. H. Worboys: I had one case of cleft palate in a boy 17 years old. His vocal organs were perfect, but he could not articulate. The trouble was entirely due to a relaxed condition of the soft palate, which hung like a curtain and was never used except when pushed up in taking food. His infirmity was entirely due to habit and could be overcome by training. Another case seemed to be a hole in the soft palate, and that I fixed with a gold piece extended from the back of a rubber plate. Before this the patient complained of severe pains in the back of neck whenever she tried to speak, but after the appliance was put in the pain disappeared entirely and she had no further trouble.

Dr. W. H. Dorrance: Cleft palate renders the patient timid, but distinct articulation can be accomplished in 90 per cent of all cases. While commending Dr. Loeffler's work, I hardly believe his appliances will accomplish the needed results. It is very difficult to take an impression in plaster, so I use the modeling compound manufactured by the Detroit Mfg. Co. and attain much better results. In all cases where there is sufficient flexible structure

I advise operation, but if there is not enough to operate is worse than useless. While the work will probably be relegated to the specialist, I believe that every dentist should get at least the fundamental principles of procedure in these cases.

PRESIDENT'S ADDRESS.

BY C. B. BLACKMARR, D.D.S., JACKSON, MICH. READ BEFORE THE MICHIGAN DENTAL ASSOCIATION, AT PORT HURON, JULY 11-13, 1899.

Last year when I was elected president of this association I began at once to wonder why, and one experienced member said, "Oh, you have a big job of work ahead of you to secure papers enough and bring the boys all over to one side of the state." So I saw it was work that was wanted this year and concluded to go at it again.

In the first place, you will notice that you don't hear any more remarks about the failures of young men just out of college. The fact is, they are getting this chemistry, bacteriology, testing, etc., down so fine at the colleges that they know why a certain remedy cures, and why a certain filling saves the tooth. The profession is beginning to realize that diseases of the teeth are like diseases of other tissues, and that there are causes for these diseases and that they are very liable to reoccur. We pay more attention to cause and conditions of disease than formerly and do our patients so much more good and benefit by teaching them to treat the cause of disease rather than its result. Preventing disease is one of the greatest accomplishments of modern times. Teaching people to do this and to get the greatest enjoyment out of life is the duty of all.

The time was when a dentist usually thought his whole income must come from the filling and plates he put in. Later his treatments, advice, etc., counted as much. I shall never forget the remarks of Prof. Taft at our graduation—that we must not go into the profession simply to see how big fees we could get, or merely to make money; but to remember that it was our duty and pleasure to see how much good we could do humanity, how much pain we could relieve, how much ignorance we could dispel, and to teach our patients useful knowledge. The work of relieving human suffering is great, and as I work along I begin to realize that the latter aim in our work brings far more pleasure than the money does.

The papers to be presented on controlling the appointment of members on the board of examiners should interest us all. I am

convinced that a legislative committee is needed badly by this society. This appointment of new members on the examining board should not be a matter of politics at all. When a Michigan Association decides upon a man to fill a vacancy, I think every one should pay attention to it, from the Governor to the meanest man in our Association, and we should stick together. In other words, I think the place to fight out such things is at our meetings instead of with politicians afterwards. I believe we should make the influence of the Association felt and respected by the Governor. Dr. Lathrop wrote me last week, just before going to Europe, that in his estimation the only way we could control appointments on the board of examiners was to have the law changed so as to have the Michigan Dental Association nominate the members to be appointed by the Governor.

The subject of "Dental Legislation and Its Enforcement" is very timely, and here I wish to call your attention to the fact that we owe the Grand Rapids Society a large amount of gratitude at least for what it has been doing in this direction. We certainly need an influence from this society to the law-makers of Michigan.

I am proud to call your attention to the number of local societies that have been organized all over our state. They are doing a great amount of good, and I hope that the dentists from any city or village which has not now such a society will learn about others which have and do likewise.

If the good advice given in the many presidents' annual messages could be remembered and accepted by the one thousand dentists of our state, they would all be active members of our Association, instead of the two hundred or less we now have. But as they have not, do you expect the same advice from year to year? There are several ex-presidents present who know that the gallons of midnight oil or the measures of vibrating electricity consumed in preparing these appeals for the "elevation of the profession" could have been better used in elevating the temperature of the Vulcanizer or baking beautiful porcelain. We must not expect to get any more out of the Association than we put in. This makes me think of a story illustrating the point that we must expect back about the same amount of happiness or unhappiness that we cause in this life. A certain feed-dealer, in selling corn-meal to a poultryman, kept adding saw-dust to the meal. Neither the poultryman nor the hens no-

ticed the saw-dust, so the dealer kept increasing the proportion of saw-dust, until the thirteen eggs which were being set upon began to hatch out, when it was found that twelve of the chickens had wooden legs and one was a wood-pecker!

I would add a little more to the whole summary of advice by calling your attention to the fact that there is a lack of personal and individual accountability for the reputation and success of this Association. So much so that a prevalent impression exists among outsiders and even among some of our members, that it is not worth while to pay the dues and live up to the code of ethics. Such an idea will cease to exist when the Association is made a necessity to any successful dentist. How many of the number who even attend pay their dues and are active members? I am fully persuaded that this same code of ethics, which in the long ago was made for the protection of the membership of the Association against quackery, has become a hindrance to the members and a protection to the quacks. By this self-inflicted gag all the mouths of the members of this Association are sealed to the general public, while the people are being poisoned by the forked tongues of the knights of the forceps. Cocain is passed onto and into the common people as "Don't *hurt* you," etc., with a guarantee of "Extracting teeth absolutely without pain or *danger*."

Just think of those *guarantees* and their *backers*, and no one to tell the people the facts. Yes, there is one—this same Michigan Dental Association. How long would these "boastful pretenders" thrive if this society should publish over its signature the facts to the people of Michigan? Does anyone imagine that a quack in a village would annoy very long an honest practitioner in the same town if this society should show up to the public the charlatan's untruthful public statements? Don't you think the public would be thankful to the society? Don't you think that member in the community would feel as if it were best for him to be a member of our society? Newspaper men are generally prejudiced against non-advertising men and this ought not to be so. Prof. Watling years ago made a resolution before this society that it would be a misdemeanor for any member to call nitrous oxid gas and chloroform "Vitalized Air." It was published publicly, and I have not seen the word used, even by quacks, since the effect of resolution was felt. This shows the result of educating the people.

I am sorry that illness prevented a paper from being read here on "The Education of the People on Dental Matters," which would have brought out more fully this subject. I really wish we could spend more money and time as a society on educating the people and law-makers, and heading off the quacks, than on banquets.

I am told this code of ethics is the very back-bone of all dental societies. I don't believe it; yet granting it was in time past, I believe in evolution and a back-bone, but I want a head on it now. As the dental law is to-day even, every lawful dentist in Michigan ought to be a member of this Association. Cooperation of the dentists of this state would be a benefit to each and every one. Why do we not urge every one to join our Association? Are we afraid our back-bone will be broken by those who have different views from ours? True progress is caused by conflict of ideas. Let us get them all in and combat the ideas of our fellows, and *right will come out right*. "We don't like them because we don't know them, and we don't know them because we don't like them." Why, gentlemen, a bad dentist in the constant company of good dentists will eventually be good himself. He can't help it; influence over each other is great. They say that if any northern minister stays *long* enough in Alabama he will go around with a rooster under each arm looking for a cock-fight.

Now one last point. Do not imagine that certain men will be stumbling-blocks. We can use them, if we have the ability, as stepping-stones to something higher. Other people are less the cause of our misery than we often imagine, and we should allow others to think more as they wish. This brings to my mind a little verse:

"I 'low my good old wife has been as dear an' kind to me,
An' jest as true an' lovin' as a wife could ever be;
Yit since the day I married her, some forty years ago,
Acrost our sky o' happiness has hung a shade o' woe:
For she was raised a Methodist, an' Methodist she'll die,
While I was raised a Baptist, an' a Baptist still am I;
An' all these years the both of us have prayed an' talked an' fit
To win the other'n over, but we hain't succeeded yit."

ITCHING EYE.—The itching eye, so common in childhood and less frequent in adult life, is often the result of uricacidemia.—*Dr. John Dunn.*

Digests.

FORMALDEHYD AS A DENTAL PASTE. By Dr. A. Schuer. I have found that formaldehyd, when supplied with oil of caryoph, carbolic acid and glycerin, will yield a most excellent dental medication which can be employed effectively in cases of pulp exposure and various inflammations of the pulp. This preparation being a paste can be put into collapsible tubes and thus made convenient for constant use. The tube admirably answers in such cases, as it is not only always ready for immediate use, but allows you to press forth a sufficient quantity and reseal the remainder from atmospheric influences. I apply the paste freely in cases of exposure and cover the medicament with cotton, leaving it in position for a day or so, according to the indications of the trouble. By its use we get immediate results, and the pain which it inflicts is of short duration, seldom lasting longer than one half hour, while oftener giving definite results in ten minutes. I frequently amputate the pulp and extract but portions, allowing the remaining tissue to be covered with the paste, protecting the latter by a film of cement. Then I proceed to fill the cavity with gold or other material in the usual manner. I am confident the time is at hand when we will not donate so much effort in the direction of pulp extraction, only removing such portions as are not healthy, and permitting the balance to remain undisturbed. Aside from the tedious labor which the operation of pulp extraction gives to the dentist, it causes severe pains to the patient, and by simply amputating such of the pulp as is diseased we not only lessen pain to the patient, but decidedly simplify the operation. *Translated for Digest by Dr. B. J. Cigrand, from Schw. Vierteljahrs. für Zahn., July, 1899.*

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DENTISTRY IN THIBET. From A. H. Savage-Landor's *In the Forbidden Land*. "In nearly all the cases that I examined the teeth were, even in young men, so loose, decayed and broken as to make me feel quite sorry for their owners, and during the whole time I was in Thibet—and I came in contact with several thousand people—I could almost count on my fingers the sets of teeth that appeared quite regular, healthy and strong. As a rule the women had better teeth than the men. No doubt the admixture of bad

blood in the Thibetan race contributes a good deal to the malformation of their teeth, and if we add to this the fact that the corruption of the blood, even apart from disease, is very great, owing to their peculiar laws of marriage, it is not surprising that the services of dentists are everywhere required. The teeth of Thibetans are generally of such a brittle nature that the dentist of Thibet—usually a Lama and a blacksmith as well—has devised an ingenious way of protecting them from further destruction by means of a silver cap encasing the broken tooth. I once saw a man with all his front teeth capped in this fashion, and as the dentist who had attended to him had constructed the small cases apparently with no regard to shape or comfort, but had made most of them to end in a point for mastication's sake, the poor man had a ghastly appearance every time he opened his mouth. The Thibetans are not very sensitive to physical pain, as I have had reason to judge on several occasions, when I have seen teeth extracted in the most primitive fashion, without a sound being emitted from the sufferer."

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OLD PETE CLENDENNIN. "I just happened to think last night of old Pete Clendennin," he began one morning when I opened the door for him. "I knew him well," he went on as he sat down, a gleam of mischief in his eye, and in his throat a chuckling like the rattling of dice in a leather box. "Yes, sir, and up to the time he was forty I reckon he was as game a man as you ever saw. You couldn't spring any new thing on to him to scare him. Fought a bear once—brushed the dogs aside and waded right into the center of the trouble and he killed the bear—cut him all to pieces. Strange disposition he had, too. Had to fight just so often anyhow. If he didn't there'd come a sort of stagnation that would interfere with his health and the doctors would have to bleed him. Many a time at breakfast he'd shove himself back from the table and say to his wife, 'Can't eat a thing—got to go out and give my blood a fresh start.' He'd probably come back with his head punched, a purple nose and a black eye, but his appetite would be as keen as a brier. As I tell you, it was this way till he had about reached the age of forty. Then he took some calomel, was salivated and lost about all his teeth. He got well—as strong as a buck, but he wouldn't fight. A man rode up to his house and called him a liar while he sat at the table eating the first mess of green peas of the

season, and he didn't even protest against it. He just clapped his hand to his mouth and shook his head. It was soon nois'd about that he'd lost his nerve, and, sir, after this many a man who had nothing against him would go over and take a fall out of him when there wasn't anything else to do on the place. And they kept him pretty busy of a Saturday after dinner—they'd come and whip him before they shaved for Sunday. They got to believing that unless they thrashed Clendennin once every so often they'd have bad luck. It went on this way, year after year, till a good many of our leading citizens forgot that he ever would fight. Well, sir, a traveling dentist came along putting in sets of teeth on time. Clendennin concluded he'd try a set, as he could have 'em on time, and might die and get off paying for 'em altogether. So the dentist fixed them up and they fitted like a charm. And the next minute old Clendennin clapped his hand to his mouth, felt of the muscles of his arm, and yelled to a nigger to fetch his horse. He galloped off, and for three days he whipped every man he met, old or young, strangers, lawyers and judges—it made no difference. Yes, sir, and it all goes to show how a little thing may influence a man. I don't know but there's a good deal in this question of teeth. Take it in a matter of success, as long as a man's got teeth he can recover if he fails—lose one fortune and make another. But let him lose his teeth and he sets down."—From "*The Waters of Caney Fork*."

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STATISTICS REGARDING FREQUENCY OF CARIES.—

At the 25th annual meeting of the Schleswig-Holstein Dental Association, Dr. Greve of Lubeck submitted the following report which elicited interesting discussion. The value of statistics regarding the frequency of dental caries does not appeal to many of the profession, but I must say much valuable information will come from a study of this subject. We are yet in the dark relative to the prevailing condition of the teeth, and when we acquaint ourselves we will learn the necessity of giving keener attention to all forms of dental derangement. We need not anticipate any remarkable scientific deductions from a knowledge of these conditions, yet it may lead up to some conclusions which we now little dream of.

In the towns of Lauenburg and Ratzeburg the examination covered children ranging from 6 to 13 years with this result: Of 421 children 20.43 per cent possessed sound teeth; 79.37 per cent showed

caries. There were eight cases of V-shaped jaws. The boys had better teeth than the girls, the former showing 81.3 per cent caries; the latter 84.6 per cent.

The investigation took place in 19 towns. It required considerable time and much effort to get possession of these facts, and many dentists labored to effect a plan whereby the entire German provinces might assist in bringing to light the general condition of the dental organs of the Teutonic race. The general result of this great task in Northern Germany is as follows:

TABLE REGARDING THE GIRLS.

Age.	No.	Deciduous Teeth		Permanent Teeth			Perfect.	Brush.	Fractures.
		Extracted.	Decayed.	Extracted.	Decayed.	Filled.			
6-8	3139	3971	10271	129	2298	14	312	269	2
9-10	2337	3908	5194	386	4856	21	219	313	6
10-12	1596	9146	1517	428	4849	92	114	322	..
12-15	2073	6869	766	2271	4891	176	152	325	3
Total.	9145	23894	17748	3214	16394	303	797	1229	11

TABLE REGARDING THE BOYS.

6-8	2921	3389	9743	511	2423	..	105	141	3
9-10	2653	5492	5862	392	5851	26	268	208	6
10-12	1922	8421	2269	760	4270	22	149	188	5
12-18	3084	7442	1156	1497	8101	115	172	121	11
Total.	10580	24744	19030	3160	20645	163	694	658	25

PERCENTAGE TABLE, OF ALL CHILDREN

	6-8 yrs.	9-10 yrs.	10-12 yrs.	12-15 yrs.
No. of children examined.....	6060	4990	3518	5157
Children with perfect teeth... 407 (6.8%)	268 (5.4%)	149 (4.2%)	172 (5.5%)	
Percentage with caries.....	93.2%	96.6%	95.7%	94.5%

Of the 19,725 children examined 95 per cent showed dental caries.

It was also noted that there were 372 anomalies of various characters, including hair-lip, cleft-palate, irregularities, V-shaped jaws, and singular as it may seem, there was but one case demonstrating congenital syphilis.

Another feature of the tables showed that the left upper teeth were more frequently decayed than the right upper, and that the reverse was the case with the lower teeth.

The society purposes to publish the investigation and present a copy to the German government in the hope of getting national aid in the further prosecution of this work.—*Translated for Digest by Dr. B. J. Cigrand, from Cor. Blatt fuer Zahn., July, 1899.*

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PECULIAR RESTORATION. By Ellison Hillyer, D.D.S., Brooklyn. The case presented a perfectly formed upper arch with the exception of the lateral incisors; the right lateral was missing

with no space between the central incisor and the cuspid; the left lateral was a mere peg-shaped tooth of nearly the proper length, but in other respects undeveloped (so far as shape was concerned). To restore this to proper shape and appearance was the object.

The patient, a young lady and a singer, felt the effect of the appearance of her mouth when showing her teeth, and the result was an habitual dropping of the lip upon the left side in the endeavor to cover the defect. A further object, therefore, was to correct this habit. The tooth, peg-shaped though it was, was fully alive, with perfectly formed enamel and no cavities. The plan of destroying the pulp and utilizing the canal did not appear advisable, nor did I desire to cut off the tooth. I finally decided to proceed without disturbing the existing conditions.

As the recital of failure is often as valuable a guide as of success in warning how not to proceed, and as ultimate success crowned my efforts in this case, I will tell how the first attempt did not succeed and why. After making a die and counter-die and swaging a perfect fitting cap for the tooth of thin platinum, I selected a lateral tooth suitable as to size and color; then without regard to the pins I ground the tooth to fit over the labial aspect of the cap in position upon the tooth. This completed, I baked the two (cap and porcelain tooth) together with continuous gum body. When cemented upon the tooth the conditions appeared quite satisfactory for a short time, at the expiration of which the patient returned with the facing bitten off. The conclusion was that the porcelain was not sufficiently strong in itself to withstand the strain.

Proceeding with a capping of platinum similar to the first, I selected a cuspid tooth about twice the required length, or at least long enough to cover the peg-shaped tooth with the porcelain above the pins. I then cut off the remaining portion of the porcelain tooth below the line of the pins and ground to fit the capping as before, but preserving the pins. I used in this instance a cuspid tooth for two reasons; first, to match the opposite cuspid (the right lateral being missing), and second, to allow a little extra support of porcelain to the pins by the pointing of the tooth. The appearance of this tooth was better than the first. With the porcelain tooth in position against the platinum capping, I bent up the pins on each side of the capping and soldered with pure gold, subsequently covering the back with continuous gum body as before. This when

set upon the peg-shaped tooth restored the part satisfactorily, and has given active service for about a year, and seems good for prolonged use.—*Items of Interest, August, 1899.*

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PRACTICAL UTILITY OF ACCURATE STUDIES OF THE PHYSICAL PROPERTIES OF THE TEETH AND OF FILLING-MATERIALS. By G. V. Black, D. D. S., Chicago. The result of the work upon the teeth showed that the percentage of lime-salts in the human teeth is uniform, the slight variations bearing no relation to caries of the teeth, diseases of peridental membrane, condition of the teeth of women during child-bearing, or to strength of teeth, as tested by pressure upon blocks of dentin.

Heretofore many of the dental profession have attributed the differences in the intensity of caries of the teeth in different persons and in the same person at different times, to differences in relative proportions of lime-salts contained in the teeth. The investigation dispels this view completely, and eventually will lead investigators in other directions as to the nature of the susceptibility of persons to caries—probably along the line which is developing serum therapy. Dr. Sternburg of Washington has collected the principal facts developed in this line of thought in a little volume which is available for your study.

In another direction, however, Dr. Black's results are of immediate practical value. It has become a habit of many dentists to regard rapidly decaying teeth as *soft* teeth, or teeth of a poor quality. This is demonstrated to be error. It is emphatically not the difference in the lime-salts they contain that constitutes the basis of the difference in their susceptibility to caries. Differences in treatment based on this supposition lead the dentist to substitute an easy filling material in exactly the case that requires the best material and his highest skill. The facts are that rapidly decaying teeth, even those poorest in lime-salts, are sufficiently hard for any kind of filling operations. We know that the active cause of caries is from without and does not appertain to differences in the structure of the teeth. Differences in susceptibility to caries are probably from without also, and are conditions that are well known to be variable or changeable. It is certain that many cases of decaying teeth in young persons disappear with increasing age if proper efforts are made to limit the damage.

In this connection the author wishes it distinctly understood that he recognizes such faults of form as give lodgment for food debris, fissures, imperfect closure of the lines of junction of the enamel plates, etc., as conditions favorable to the beginning of caries. His investigations, however, have no relation with them.

It was not the speaker's intention to say anything in his papers about the differences in the hardness of teeth to cutting instruments, about which he has been so frequently asked since their publication. Whenever hardness or softness is mentioned it has been with reference to the prevailing expression of more or less perfect calcification, or with reference to the dentin to withstand heavy pressure without crushing. The doctor says, however, that experimentally out of the mouth he was unable to find any marked difference between the teeth classed as soft and teeth classed as hard, and that it is his impression that much of the difference in the hardness of the teeth as found in operating in the mouth is a matter of position, direction of cutting and opportunity. But the strength of the teeth under stress is something very difficult from their hardness before cutting instruments, and probably not at all correlated.

The variations in strength of teeth have been shown. The difference amounts to 35 per cent, excluding pulpless teeth, or 41 per cent, including them. When we consider the narrow range of variation in lime-salts, this difference in strength seems very wide, but is found not to be directly dependent upon the percentage of lime-salts. The weakest dentin found living when the tooth was removed bore a stress of 195 pounds on a block .085 x .085 x .085 of an inch. The hardest of your gold fillings can be crushed out of all semblance of its original form upon a block of dentin from the weakest human tooth without injury to the dentin. That is enough to say about "teeth too soft for gold fillings." But this fact does not give you license to drive your plugger point through your gold onto the dentin or enamel, nor to abuse a sensitive peridental membrane in making a gold filling for a child, or in teeth that have become sensitive from exposure of dentin where consequently use in chewing food has been avoided. If these be filled temporarily with some plastic material for the relief of sensitiveness, and the patient directed to bring them into full use, and then gradually accustom the peridental membrane to bear heavy stress, they will be found to bear the mallet with little or no pain. Although the tooth itself is

hard enough, its surroundings must have due consideration. The most serious hindrance to the proper condensation of gold fillings is found in the sensitiveness of the peridental membrane. From the examinations Dr. Black has made he concludes that man living on foods in a state of nature would be able to close his teeth with a force of from 200 to 300 pounds. But in the conditions of civilization and the artificial preparation of food stuffs, the peridental membranes are not accustomed to so much stress, and the force is reduced to 100 pounds or less even in perfect health. Theoretically, the peridental membrane of each individual tooth should be able to sustain it against the entire muscular strength of the jaws. But from the use of soft foods the membranes are so weakened that man continually limits his muscular exercise to the amount of force productive of pain in the peridental membrane. This has been generally true in trials of the force of the bite, and gives rise to the wide variations noted in the writer's papers.

Filling Materials. Little is known of the physical properties of gold. The principal discovery has been of the welding property of the metal. The main object of experimental studies of the physical properties of gold is to establish the correlation that exists between the strength of gold-fillings, the teeth in which they are placed, and the stress brought upon them in mastication; and, incidentally, to see whether or not one man understands the efficiency or inefficiency of his own or his neighbors' method of packing gold. We have had nothing to which we could refer as a standard in finding a mean of density and strength of gold fillings. Having no fixed method we have to refer to clinical observation, which cannot serve as a sufficient guide.

In all cases that have come under Dr. Black's instrumental observation he has found that the teeth are harder and stronger than the gold-fillings. We often make gold-fillings that are too frail for the purposes intended, and the author has suggested plans of testing our operations by which this can in a measure be prevented.

Among the twenty-four fillings presented to the writer by members of the New York Odontological Society, made in steel dies for experimental purposes, the strongest filling has a specific gravity of 18.47, while the lightest has a specific gravity of about 12.53. This variation must be regarded as very wide. In this list there are five remarkably heavy fillings, which seemed to Dr. Black applicable in

the mouth, although perhaps a greater degree of force was used than was applicable in actual work in the mouth. The lightest was so frail that it would be condensed upon itself and compacted into smaller compass by the stress of mastication in chewing beefsteak, and if the surface alone is made hard by malletting cohesive gold, as was suggested, the margins will fail to readjust themselves anew to the margins of the cavity, and the filling, if not pushed out of position entirely, will absorb animal matter. On this point research has taught us that if a frail filling of non-cohesive foil, confined by four walls condenses upon itself, it is better to finish with non-cohesive gold. The differences between cohesive and non-cohesive fillings, when placed under stress, have been so pronounced that there is no mistaking the one for the other. A truly cohesive filling of fair density acts precisely as cast or hammered gold, enlarging in circumference as it is shortened, its sides remaining smooth. Non-cohesive fillings, on the other hand, break and split up, showing ragged sides, the natural result of non-cohesion. Here the writer states that non-cohesive fillings are adapted only to cavities with four good walls. His observations further impressed him with the idea that a lower density than 15 is inadmissible in any gold filling, whether of cohesive or non-cohesive gold.

The die or mold in which these experimental fillings are placed has been carefully polished with emery, which has left fine lines upon its interior surfaces in the hardened steel. A filling that has been perfectly adapted to these walls in all of its parts will show these lines unbroken upon its surface. Without this adaptation in a very fair degree, a filling is inferior, no matter what its density or strength. In the count of excellence in operating that is and must always be the first count. While density and rigidity must ever remain secondary to adaptation, it still holds that rigidity is a necessity to endurance, and it is especially the degree of rigidity attained, and attainable, that is the subject of this investigation.

In order to test whether the experimental fillings sent him properly represented the density attained in fillings placed in the teeth, Dr. Black examined a number of gold fillings which had been placed in the teeth and lost from any cause. The average specific gravity of these old fillings was 15.94, while the average specific gravity of the experimental fillings was 16.48. From the history of these old fillings, the writer was convinced that the experimental

fillings are not far wrong in the main, and that we are not making our fillings dense enough. It is certain that the differences in *density* seen in these lists of fillings are due in but small degree to the amount of physical force used in their condensation. Differences in *rigidity* are more directly due to the force used.

To make a very dense filling *does not* require heavy malletting, but does require that the gold be used in thin pieces, carefully and evenly laid, and that the malletting be complete over the surface of each piece. Such filling will not be very hard. To make a hard rigid filling of great density *does* require heavy malletting in addition to care in the laying of the gold. It occurs, therefore, that a very dense filling may be soft, if the malletting is light, while on the other hand, a filling that has been made very rigid by heavy malletting may be of less density because of less care in the placing of the gold. Again, the specific gravity may be reduced by heavy malletting with a small point, which may pit the gold deeply. To make a very dense filling the plugger point should be proportioned to the force of blow employed. The doctor finds he can obtain the densest filling with a plugger point having an area of four one-hundredths of an inch square.

In order to utilize the density and rigidity of filling-materials to the best advantage, certain rules as to the preparation of cavities must be observed. We can no more support occluso-proximate fillings, that present broad surfaces to the occlusion, upon a narrow shelf for a seat at the gingival wall, than we can make a cone support heavy stress upon its little end. We must broaden seat of filling to bear load by cutting an additional seat in central part of crown of tooth. Little further anchorage is required.—*Cosmos*.

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NEW METHOD OF REDUCING OLD DISLOCATIONS OF THE LOWER JAW. By T. A. McGraw, M.D., Detroit. James Loder, aged thirty-two years, June 6, 1898, suddenly fell, paralyzed in his left arm and leg. The history of the case is not clear, and it is uncertain whether his jaw was dislocated when he fell or immediately afterward while yawning. However that may be, the symptoms of dislocation made themselves manifest immediately after the fall and continued without intermission until I reduced it. There was a gradual but nearly complete recovery from the paralysis of the leg and thigh, and to-day they seem as sound and powerful

as their fellows. The left hand and arm, however, still show the effects of the stroke. The hand especially is shrunk and stiffened. Its muscles are atrophied and its motion is much impaired. The evident paralysis apparently blinded the man's many physicians to the true nature of the deformity and loss of function of the jaw.

His difficulty of speech was referred to a paralysis of the muscles of the mouth, and the inability to close his mouth to spasm and permanent contraction of the depressor muscles of the chin. It was not until October that a correct diagnosis was made of his injury. About the middle of October Dr. F. W. Robbins made a prolonged but unsuccessful effort to effect the reduction of the dislocation with the patient under anesthesia.

I saw him for the first time on November 2. I found a man of magnificent proportions and great muscular development, with typical symptoms of a bilateral dislocation of the lower jaw. There were marked hollows in front of both ears. The jaw was open and thrust forward so that the chin protruded. The motion of the jaw was extremely limited. The teeth could not be brought together, mastication was impossible and the speech was much impaired. During the five months which had elapsed since the injury no improvement had taken place in the motion of the jaw. I was unable to discover the cause of the paralysis. He had not been ill before, and the suspicions entertained of syphilis were not confirmed by his history or by any existing symptoms. His heart sounds were clear and his urine was normal. It is possible that he may have suffered from some form of embolism. The man was put under chloroform, and I made a protracted effort to put the jaw in place by traction, by inserting wedges between the teeth, by Nélaton's method, and in fact by all methods which could be used without especial apparatus. I failed completely, and could not see at the close of the trial that the condyles had been stirred in the slightest degree from their abnormal position.

On November 9 I provided myself with a strong steel hook, made especially for the purpose, with a short prong bent in such a way as to run parallel to and near the shaft. The space between the prong of the hook and its shaft was just wide enough to permit the hook to pass over and grasp the jaw at the sigmoid fossa. I purposed making incisions under each zygoma, separating the fibers of the masseter, passing the hook through in front of the condyle on

each side and over the bone at the sigmoid notch, and then pulling downward and backward until the condyle was disengaged and slipped into place. In carrying out this plan, I made first a T-shaped incision below the right zygomatic arch. I found it easy then to pass the hook through the masseter by separating but not dividing its fibres, and to fasten it over the bone in front of the condyle. Pieces of cork were inserted between the molars as far back as possible, and an assistant was directed to pull the chin forward and upward with all his force, while I myself made traction on the hook. This was continued over fifteen minutes before I could feel the jaw yield to the strain. It was rendered more movable, but could not as yet be replaced in its normal position. I now made a straight and short cut under the left zygoma and succeeded in passing the hook as before. Repeating on the left side the efforts I had made before on the right, I had soon the satisfaction of feeling the bone slip into place. The chin fell back to its proper position; the teeth were brought together, and motion was restored. The jaw was kept bandaged for two weeks and all motion forbidden. The patient took nourishment in fluid form without opening the mouth. It was interesting to note how after a few days the jaw seemed to settle more and more into its normal relations. Directly after the operation there remained a slight projection of the teeth and an abnormal fullness over the joints. This gradually disappeared and the man left the hospital with the form and function of the jaw perfectly restored. The operation was followed by some inflammation and suppuration, which, however, soon subsided and his recovery was perfect. I found on trial that the first incisions, those made on the right side, were unnecessarily long, and when I operated on the left side I contented myself with a straight cut about an inch in length. I am satisfied, however, that this too was longer than necessary, and in another case I should content myself with the very smallest incision which would permit the hook to pass through the muscle and over the jaw. The fibers of the muscle are easily separated, and the hook can be passed over the sigmoid notch without exposing the bone to view. On traction the muscle would yield and the elasticity of the skin would make no opposition to the downward pull. Although I have found in several systematic works on surgery the advice to proceed in case of failure to reduce the dislocations of the jaw to operative measures, it is curious that

no such author whom I have been able to consult has described any such operation or cited any cases. The only cases of operations made for this purpose which I have been able to find in the periodical literature were:

(1) That of Brockway. A bilateral dislocation of thirteen months' standing in a woman thirty years of age, after unsuccessful trial of other methods, was reduced by making incisions below the zygomas, exposing the condyles and the glenoid fossæ, and prying the condyles out of their abnormal positions by some blunt instrument. The use of the jaw was fully recovered.

(2) Two cases of Dr. R. H. M. Dawbarn. He presented a patient who had suffered a long time with an unreduced bilateral dislocation of the lower jaw. Several unavailing attempts had been made to reduce it. Dr. Dawbarn had made incisions almost dividing both masseter muscles, enabling him to reach the displaced bone and pry it back into place. The result was permanent and satisfactory. In another case the speaker had been able to effect reduction after nearly dividing only one of the masseter muscles.

(3) Mazzoni of Rome has described an operation for the relief of an irreducible dislocation of the lower jaw of eight days' duration. He resected both condyles, and after three months' treatment had a successful result.

Old dislocations of the lower jaw are not common. The inconvenience arising from the injury makes the patient generally clamorous for aid, and the symptoms are so pronounced that mistakes in diagnosis rarely occur. The reduction of the recent luxation is usually not difficult, and cases of this kind are rarely neglected so long that the bone becomes fixed in its abnormal position. As regards the instrumental methods in vogue for the reduction of difficult dislocations of the jaw, they are all based upon the use of force exercised within the mouth by means of wedges and levers. The fulcrums for this leverage are the molar teeth, upon which the instruments rest and which are prised apart. But force applied within the mouth is exerted at great disadvantage. In an old dislocation a pressure applied to the molar teeth sufficient to break adhesions, stretch the contracted temporal muscles and disengage the jaw must endanger the teeth. How many such teeth have been broken in attempts at reduction does not appear in the records. Probably the surgeons have thought the matter too trivial for mention, and

yet it is no small matter to suffer the loss of molars. However that may be, there will be occasional cases which will resist all such efforts at reduction. For such the surgeon has a choice of two operative procedures, the one adopted by Drs. Brockway and Dawbarn, of incisions over the glenoid cavity and through the masseters, the exposure of the injured bones, and then reduction by prying the condyles out of their false position by means of chisels or similar instruments. In so doing the fulcrum of the lever must be the zygoma itself. The other method is that which I have just described. When it is taken into consideration that by the use of a hook and traction it is not necessary to expose the bone or joint, or to cut the masseter across its fibres, I do not think there can be any question that my method is the simpler and better. In the one case reported I made incisions unnecessarily long. I know now that the operation could be done through a cut so small that it would be practically subcutaneous.—*Med. Record*, Oct. 7, 1899.

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PROPER FOOD STANDARD IN ITS RELATION TO THE TEETH. By George R. Gray, D.D.S., Worcester, Mass. Read before Harvard Odontological Society, March 30, 1899. We develop and subsist solely upon such substances as are taken into the body by way of the mouth as foods. With this fact clear, it is plain that such foods must contain in certain proportions the exact chemical elements of which our bodies are composed, or perfect development will not take place. There is no question but that, taken as a nation, we are a candy-eating and prepared-food-consuming people, and this to a great extent is the cause of our poorly-constructed teeth. The question might be asked, why we of to-day, comfortably clothed, well fed, apparently should have fallen so from the high standard of our grandparents? The scientist would say that we are starved and he would be correct, for with food plenty and of the best, we throw away all that which makes muscle, bone, sinew, teeth, hair, etc., and in the barrel of snow-white best family flour retain only the starchy elements that supply the body with heat, the carbonates.

Our forefathers, whose food consisted mainly of coarsely ground grains and unbolted flour, were men of wonderful strength of fibre, intellectual, virile and aggressive. Their families were large and their descendants rapidly peopled the land. With their storehouses

running over with grain, they introduced the bolting-cloth and used for their own food fine white flour from the heart of the grain. All the rest, the bone and sinew-producing part, which could not be so finely ground and which gave the dark color, was thrown to the animals. Nature followed her unvarying law and took her revenge. For those who would not eat the bone-building gluten she refused to supply bone-material, and as a natural result a full sound set of teeth became a thing almost unknown, and the frail, half-nourished apologies for teeth gave out in early youth.

Unfortunately, wheat as it is usually presented to us in the form of bread, biscuits, cake, etc., is, in the effort to produce the esthetic effect of whiteness, robbed of its nitrates or phosphates, in which reside the bone and muscle-producing elements, while there is left only the carbonates or heat-and-fat-producers. As there are fifteen elements entering into the composition of the body, it follows that perfect development can only be had in presence of all these elements in sufficient quantity, and as the framework is largely composed of lime phosphates, it is evident that these must be supplied in the food, and yet as a people we eat largely of that unnatural product, white flour, which contains no lime, while the entire wheat kernel does contain all the fifteen elements of which the body is composed and in about the same proportions, and for this reason it may be called the natural food for man. We may as well build a house out of poor materials, poorly put together, and expect it to endure, as to expect the human structure to be what it was intended if it is built of improper food. If we eat improper food we must suffer; there is no escape. The unfortunate condition of our people to-day is a direct result of our present civilization, and as improper food is the foundation and main cause of human ills, it is plainly seen how poorly we of this land of abundance of good things are supplied with proper food. Bread, the so-called "staff of life," is usually made of white commercial flour; and the other food products made therefrom, such as rolls, buns, waffles, pan-cakes, pies, etc., are the chief cause of the physical weakness and nervous disorders of our people. In the light of the present it is little less than criminal to give a child food made of such flour, especially when at the same meal many other starchy foods are supplied, such as rice, potatoes, corn-starch pudding, etc.

A certain per cent of what we eat should be heat-making food,

another per cent muscle-making, and another per cent to make hair, teeth, nerves, etc. If any of these are not provided for, there must be a wasting of tissues, which is but another name for consumption. Under these conditions the system cannot successfully combat disease; on the contrary it invites it. The panacea for all this trouble is found in nature in the form of the wheat berry, which should be given to us in as nearly a natural condition as possible. The present milling process leaves a product (mainly starch) which is so dead that the American people yearly pay millions of dollars to buy yeast, baking powders, soda, etc., for lightening, and lard, butter and other greasy substances to shorten and revive this disorganized substance into shape to tickle the palate; and then, to counteract the evil effect of this unnatural food, other millions are spent for medicines. There is no violation of nature's plain requirements so senseless and so damaging as to separate the natural allied properties of the whole wheat. The excessive use of white flour products, together with other starchy foods, is doing and has done more harm to the people than any other agency ever has or ever can do. If children have this kind of food largely the natural result will be weak nerves, rickety bones, weak muscles and poor teeth, good candidates for physical failures.—*International, Sept., 1899.*

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USE OF TIN-FOIL IN VULCANITE WORK. By Allison R. Lawshe, D.D.S., Trenton, N. J. *Treatment of the Model.* Polish the plaster model with a ball of cotton charged with powdered soap-stone. This fills, or partially fills, all minute bubble holes or depressions. Then coat it with mucilage or gum tragacanth, and with a ball of cotton at once press down and burnish on the palate of the model the center of a sheet of No. 6 tin-foil (such as used for filling teeth) and work the ball outward over the ridge and backwards towards the heel of the model until covered. The surplus foil may be cut away with a sharp knife and a drawing cut. Of course the foil will wrinkle and fold to a certain extent, but the wrinkles and folds can be almost entirely burnished away. This burnishing should be continued until a high polish is attained and the model has the appearance of a polished metal die. The gum tragacanth unites foil to plaster and makes burnishing possible.

The teeth are now to be mounted and the case waxed up. If plain teeth are used, the labial and buccal parts with a small scraper

or other suitable instrument are carved and modeled in imitation of the natural gum, and the entire wax surface smoothed with a fine blow-pipe flame. Then the case is flaked in the lower half of the flask (the wax having been first chilled and the model soaked in cold water), the plaster being allowed to reach only to the rim of the plate.

Directions for Stippled Gums. Now if it is preferred to have the labial and buccal gums smooth when finished, and not stippled to imitate nature, a strip of the No. 6 foil is burnished to the wax without any mucilage; the ends and the edge covering the teeth being turned sufficiently to be caught in the plaster investment of the second half of the flask. But if the stippled effect is desired, the strip of burnished foil is carved at the gum festoons with the point of a sharp lancet, removed, flattened, placed upon a piece of heavy foil (No. 30), the pattern marked with an excavator point and cut out with shears. The straight edge of this is then slit to prevent wrinkling when adjusted and burnished to place.

The strip is now warmed a trifle, adjusted to the gums, pressed to place with the thumb and burnished with the cotton ball. The slits prevent wrinkling by overlapping. The stippling is then done by gentle tapping with a blunt excavator to indent but not pierce the foil, or by very light blows from a fine plugger point in the engine mallet. The ends need not be turned to be caught by the plaster, as the indentations suffice.

The surface of the plate next the tongue (linguo-palatal) is coated with the thin foil with the aid of the cotton ball. The surplus edges are left free to be engaged by the plaster investment. No mucilage is used.

The two halves of the flask must be separated with care for the removal of the wax and packing of the rubber, or the thin foil will tear. Boil the flask several minutes in water until it is certain the wax therein is semi-fluid. It will then offer no resistance to the separation and the two halves will remain intact.

After the case is packed, if it is desired to close and separate the flask to ascertain if the proper quantity of rubber is present, the model is given a coating of liquid soap.

Finishing the Plate. Finishing is very simple. When the denture comes from the vulcanizer the heavy foil can easily be pulled off, but the thin must be removed by a bath of dilute nitric

acid (about 1-5) after the adherent plaster has been scraped and washed away. The excess of rubber is filed off and the gum festoons, where needed, are shaped with chisels. The few bubble hole hillocks are broken away with a scraper or spoon excavator. Excepting where the chisel is used and the surplus rubber removed no polishing is necessary; the case comes beautifully polished from the acid bath.

Aside from the fact that the use of tin-foil saves time in finishing, it affords better results: the palatal surface of the denture is polished; the soapstone powder in large measure prevents the formation of bubble hole lumps (the few that are formed probably are caused by bubble holes just beneath, but not opening upon the surface of the plaster model that cannot be reached by the soapstone but which the rubber breaks into); the palatal portion of the plate can be made thinner than ordinarily is advisable, because there will be no fear of polishing a hole in the plate; the rubber surface is more dense, and therefore more hygienic than is the surface polished with sandpaper and pumice; and lastly, the air-chamber and rugæ can be reproduced on the linguo-palatal side of the plate, thus presenting to the tongue a more agreeable surface than the clam-shell concave of the average denture.—*Items of Interest, Sept., 1899.*

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SUCCESSFUL PROSTHESIS WITHOUT A MODEL. By N. W. Kingsley, D.D.S., New York. For more than forty years I have been teaching my students and preaching to others that a correct model is a prerequisite in the construction of an artificial denture. Yet I have recently met and mastered a case where it would have been so difficult, though possible, to take impressions from which a correct model could have been obtained, that it seemed advisable to proceed without a model.

The patient before the age of puberty exhibited signs of inherited syphilis. The lesion attacked the hard palate of the mouth together with the superincumbent bones, and by a slow process, continuous throughout all the years of her life, the absorption of hard and soft tissues has progressed until at present the vault is a cavernous dome which includes both oral and nasal cavities. The bony bridge of the nose has disappeared, but stretched across the base is a short rigid cartilaginous tissue, which, together with the anterior edge of the remainder of the velum, has enabled me to sus-

tain a prosthesis, with which she is not only enabled to masticate her food, but to properly enunciate her words in speaking, so much so that no defect is noticeable to her hearers.

To have filled this dome with plaster would not have been so troublesome as to have removed it after setting, certain irregularities and convolutions indicating that difficulty would be met. That the reader may have some idea of the shape of the dome, an illustration is introduced. The figure shows the prosthesis for the upper jaw resting on a model of the lower, on which is also seen a partial denture supplied to complete occlusion. That portion above the row of artificial teeth fairly indicates the vault into which it fitted. This portion is hollow with a hole front and back to permit breathing. The little groove in the front fits over the cartilage previously mentioned, while a similar groove at the back rests against the edge of the soft palate.

The method adopted was as follows: The patient being in the chair, plaster of paris mixed thin, but salted to set quickly, was introduced with a knife and smeared over all the surface of one half of the dome, from the median line down and to the remains of the maxilla. When hardened this shell of plaster, not more than three-sixteenths of an inch thick, was readily removed. A model of one side of the vault was made from this, and upon this model was vulcanized a single layer of vulcanite. This was then trimmed to appropriate shape and fitted to the mouth so that it covered one-half of the vault. With this in position the opposite side was smeared with plaster, enough being carried over upon the vulcanite so that the two could be properly put together after removal from the mouth. The plaster was taken away first, and then the vulcanite piece. These were rearranged and a plaster model made, which when completed showed one side of the vault covered by the vulcanite, the other being uncovered. A layer of rubber was then vulcanized over this side and united at the same time with the first piece. When finished I had a thin shell of vulcanite, which accurately lined the vault when placed in position.

This shell was then filled with plaster, which was allowed to set. Soft modeling compound was then added and the whole placed in the mouth and the bite obtained. From this models for articulation were procured, by which the teeth were set up and waxed to the parts already vulcanized. The teeth in position, the plaster which

filled the shell was carved into appropriate shape to form a proper roof to the mouth, and over this plaster was then laid a thin layer of wax, which of course was replaced by rubber in the final vulcanization which attached the teeth to the parts first vulcanized. Subsequently a portion of the dome part was cut away back and front to serve as apertures for breathing, and through these holes the plaster, which had supported the roof during vulcanization, was dug out.—*Items of Interest, Sept., 1899.*

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EFFECT OF HEAT ON DENTIN. By W. D. Miller, M.D., D.D.S.,¹ Berlin, Germany. I have seen an abstract of a paper by G. W. Cook of Chicago on the above subject, in which particular reference is made to the possible injurious effect that the use of high heat for drying root-canals may have upon the antrum. The author of the paper arrives at a conclusion which appears to be very reasonable, that the judicious use of the root-canal drier has no detrimental effect upon the dentin. The question of the action of heat upon the dental tissues is, however, one which cannot fail to interest the dentist, aside from any practical application which it may have.

We are all well aware of the fact that the effect of simply drying the teeth at ordinary temperatures is to make them brittle and to destroy the bond of union between the dentin and enamel, a result which is brought about much more quickly by subjecting the tooth to artificial temperatures, say 100 deg. C, while still higher temperatures destroy the organic matter altogether and render the tissue exceedingly pliable.

A series of experiments in which sections of teeth were exposed to different degrees of heat from 50 deg. C to 500 deg. C for varying lengths of time would furnish a ready solution of the question, as far as dry heat is concerned. When we introduce a hot root-canal drier into a moist root-canal we have a sudden development of superheated steam and the moisture in the superficial layers of dentin reaches a temperature probably somewhat above 100 deg. C. Experiments relating to the action of heat upon the dentin would accordingly be made more interesting and valuable by being extended to include the action of moist heat.

The object of this short communication is only to suggest this line of work and to report a few results of experiments which I began some years ago but was not then able to conclude. I was at

that time looking for some means of converting the harder, transparent variety of ivory with the more opaque variety, since the latter has a more extensive range of use, especially for piano keys, and therefore commands a higher price. I had no difficulty whatever in solving the problem, so far as increasing the opacity of the ivory was concerned. Pieces of transparent ivory kept in a few minutes in the vulcanizer at 110 deg. C were found to have become beautifully opaque; but at the same time the heat had so affected the organic matter of the ivory as to materially lessen its lustre, toughness and general durability, so that the method was practically useless.

When carious teeth were subjected to higher temperatures (160 deg. C) for ten minutes, the carious portions were found to be completely dissolved and the whole tooth so brittle as to be easily broken in the fingers. The enamel suffered comparatively but slight change. It would be a very simple matter to carry out an extended series of experiments on this line, and there is reason to believe that the results would be sufficiently interesting to fully reward the time and labor expended.

In this connection it might be well to point out that the relation of water to the tissues of the tooth may be of a much more intricate nature than the article in question would lead us to think. In the *Cosmos* for 1894, p. 269, I have already called attention to the experiments of Gabriel, who found that the dentin contains water in three forms: (a) as tissue water, which evaporates at ordinary temperatures (drying), but is completely driven off only after an exposure to 100 deg. C, for some hours; (b) as water of crystallization of the mineral substances of the teeth. This may be driven off by a temperature of 300 deg. to 350 deg. C; (c) as water of constitution, which cannot be expelled by heat at all, except in the presence of silicic acid.—*Ohio Journal*, Oct., 1899.

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PLATE VULCANIZED BETWEEN METAL. [By L. O. Green, D.D.S., Chicago. Read before Chicago Dental Society. I have a full upper model with antagonizing bite mounted on the articulator. A piece of tin foil, No. 10, is placed over the palatine surface, burnished to position with a pledget of cotton gently forcing the foil into place, taking care not to tear it by using too much force. After working the foil into close proximity to the model

over the whole surface to be covered by the plate, an "apple-seed" burnisher is used to smooth out all wrinkles and folds, care being taken to adapt the foil perfectly over the surface of the model, reproducing as nearly as possible the natural rugæ. Now carefully remove the foil and coat the surface of the model over with shellac varnish, and while wet place the foil back in position. After the varnish is thoroughly dry, use finely powdered soapstone on a ball of cotton to polish the foil—rubbing it vigorously. A piece of "tea-lead" (such as can be gotten from the inside of imported tea boxes) is laid upon a glass slab, and with a toothbrush handle is burnished out perfectly smooth. A layer of this is placed on the model over the foil and worked into place by the use of cotton pledgets and burnishers—same as I adjusted the tin foil.

This is repeated, covering each previous layer until there are three thicknesses of tea-lead well burnished and adhering together. This represents the thickness of the purposed rubber plate; it should now be removed from the model carefully and the entire edge trimmed as indicated. When replaced a small rim of wax is placed on the alveolar ridge, just sufficient to hold the articulated teeth in position and cover the heads of the pins smoothly, care being taken to keep all wax off the palatine surface and away from the rugæ as well. On the labial and buccal surfaces the gums are formed with wax in the usual way.

Another piece of the smooth tea-lead is now taken and carefully adapted over the palatine surface, allowing it to run up over the occlusal surfaces of the teeth just far enough to catch and remain in the plaster with the teeth when the flasks are separated. The flasking is done in the usual way. When separated the three adhering layers of tea-lead are removed and the wax boiled out. On the model side of the flask there is a bright tin foil surface, and on the other portion a dull tea-lead surface.

Before packing the rubber in position I take a ball of cotton saturated with thick soapsuds, and thoroughly soap the tin foil surface, in order to prevent the foil from adhering to the rubber when vulcanized. The tea-lead surface is polished with mercury by rubbing with cotton. The higher the polish given to this surface the more finished will be the vulcanized surface.

Rubber when vulcanized between two polished surfaces of metal is turned out as highly polished as is the metal surface in contact.

After the case is vulcanized, pull off the tin foil and tea-lead. Scrape, carve and polish the labial and buccal portions in the usual way. The palatine surface you will find polished, but in order to give it a high finish I take my softest brush wheel and whiting; in this way you obtain a beautiful high finish that you cannot get otherwise. A plate constructed in this way I consider to be much stronger than the old way of making plates. Vulcanizing between metal tempers, so to speak, the rubber and it will bend or spring, whereas the ordinary plate would break. This method produces a plate of uniform thickness, and it is worn with much more comfort to the patient, being very thin and light, and the rugæ of the mouth are also reproduced.—*Dental Review*, Sept., 1899.

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INFLUENCE OF PREGNANCY ON THE TEETH. Our old text-books of obstetrics generally contained a warning to the effect that if a pregnant woman submitted to the extraction of a tooth she ran the risk of abortion as the result; and really, so far as the systemic works show, we have advanced but little beyond this in our knowledge of the influence of pregnancy on the teeth; although it is hardly to be doubted that the dentists could give us a good deal of information on the question. Considering the barrenness of our own literature in the matter, we are glad that it has been made the subject of particular investigation by M. Terrier, in a Paris thesis. M. Terrier's conclusions are thus summarized in the *Presse Médicale* for June 3: In a great number of women pregnancy has a very decided influence on dental caries. It is particularly toward the end of the first month that toothache is apt to occur, and in many cases it is repeated toward the close of gestation in the eighth or ninth month. The progress of caries is more rapid during pregnancy than at other times, the sensitiveness of the teeth is heightened, they are more friable, and their chemical composition undergoes certain modifications. The dental affections that may arise are attributable to two sets of causes, local and general. Among the local causes are gingivitis, a changed composition of the saliva, and acid regurgitations from the stomach. Among the general causes are (1) morbid systemic conditions and disorders of the digestive, the urinary or the biliary apparatus (the last mentioned giving rise to a form of self-intoxication, termed by M. Pinard *hépatotoxémie gravidique*), whence there result nutritive affections of the tissues in general,

and of the bones and teeth in particular; (2) a heightened impressibility of the nervous system, giving rise to dental neuralgia and odontalgia, which are further aggravated by the gingivitis with its passive congestion, whereby the pulp is, so to speak, strangulated in its cavity, becoming the chief cause of toothache. The general disorders of the pregnant woman place her at a disadvantage in the struggle of her teeth against the progress of caries; the production of secondary dentin, which normally fills the dental canals and serves the pulp as a barrier against caries, is diminished, and a portion of the necessary calcium salts is diverted to the formation of points of ossification in the fetal skeleton. To a certain extent it is possible to prevent these affections of the teeth, and certainly it is highly desirable to make the attempt. A minute examination of the mouth and teeth at the outset of pregnancy is imperative. Every trace of tartar should be removed; if there is gingivitis it should be treated; caries also should be treated, but care must be taken not to fatigue the patient. It is almost always practicable to fill cavities. The old caution about extraction, dating back to Antoine Petit, in the seventh year of the first French Republic, should be observed, especially in the case of very nervous women. Systematic care of the mouth should be taken during the whole course of pregnancy and lactation.—*Editorial in N. Y. Med. Jour.*

* * *

ALVEOLAR HEMORRHAGE. By Charles P. Chupein, D.D.S., Philadelphia. Dr. K. had had an upper third molar extracted by Dr. I. D. Thomas, under the influence of nitrous oxid gas, about 9 o'clock in the morning. About 2:30 p. m. of the same day he came to me looking very pale and feeling excessively weak from the loss of blood in the interim, having lost, as he reported, at least two quarts. His mouth was filled with a dense clot, which after removal revealed a constant and considerable flow from the socket of the extracted molar. Syringing this out with hot water, I rolled a pellet of cotton loosely, as large as a marble, and dipping this into a batter of quick setting or impression plaster of paris, conveyed it quickly to the socket, retaining it in place by more cotton and a cork, which pressed the locality by the opposing teeth.

By the time that this was accomplished the man was so weak that he could scarcely stand, and I insisted upon taking him home. Although he was less than a block from his residence he fainted

twice before I got him home, but the remedy was so effective that in less than thirty minutes all bleeding was arrested.

I lay no claim to originality to this treatment, because it belongs to the late Dr. Kingsbury, who reports to have saved the life of a patient who lay at the point of death from alveolar hemorrhage, when all other means to arrest the bleeding had failed.

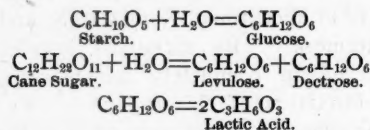
I have been successful in the arrest of alveolar hemorrhage also by the internal administration of five grains of tannic acid in water, taken every half hour until three doses are taken. Five grains of tannic acid are dissolved in as much glycerin as will take up this quantity, then one-fourth of a tumbler of water is added. Two tablespoonsful of this are taken every half hour until three doses are consumed. This has been very efficacious with me when the bleeding was quite profuse and had continued for several hours.

Whenever bleeding occurs after extraction, the patient should lose no time in consulting a dentist.—*Items of Interest, June, 1899.*

* * *

OUR PRESENT KNOWLEDGE OF DENTAL CARIES. By H. Prinz, D.D.S., St. Louis. Read before St. Louis Dental Society. Dental caries is a universal disease of the human race; its origin may be traced back to the earliest obtainable data of history. The affection is relatively unlimited and of such importance to the dentist that we may safely say: Without dental caries we would have no dentists. In consequence of its universality investigators have been occupied from the earliest days to find an explanation of its cause. The various theories which were brought forward are in harmony with the ruling doctrines of the healing art and changed accordingly with the advancement of medical knowledge. The pathological history of caries may be classified in six groups: (1) The humoral theory of Hippocrates (4566 ch.) It was still upheld by Serre in 1788. (2) The theory of inflammation of Galen (131). Boedecker and the late Abbott have been its strongest advocates. (3) The parasitic theory of Ringelmann, 1884. (4) The chemical theory. It was indorsed by the leading scientists up to 1884. Such men as Tomes, Watt, Taft, Magitot, Baume, Harris, etc., are found amongst its upholders. (5) The electro-chemical theory, first advanced by Bridgmann; at present it is still defended by Palmer; and (6) The chemico-parasitic theory, first mentioned by Erde in 1843, later by Leber and Rottenstein, Black, Miles, Underwood, etc.

Miller finally demonstrated by actual experiments the direct etiology of the disease, which he thus sets forth: The cause of dental caries is a chemico-parasitic process of two distinguished stages; the decalcification or softening of the tissue and the dissolution of this softened tissue. The acids which cause the old calcification of enamel and dentin are for the most part produced directly in the mouth as a result of fermentation—carbohydrates, namely such which contain sugar, starch and gummy substances, as sweets, bread, potatoes, etc., furnish ample material for the process. By the action of the organized ferments of saliva, i. e., ptyalin, hydration is installed, splitting the higher compounds, such as sugar and starch, in the more simpler ones, mostly glucose. The bacteria of the mouth will then cause the further splitting of the glucose, or similar molecules, in lactic acid.



Caries usually begins with the destruction of the enamel. Through the able researches of J. L. Williams of London much light has been thrown upon this hitherto dark phase of pathology. By his superior histological technique he was fortunate to demonstrate more clearly the formation and composition of the tissue, which he found to consist of a calcified cement substance and of prisms composed of globules of uniform size. Dilute acids which are brought in contact with enamel seemingly destroy the binding substance more readily than they do the prisms themselves. The remnants of Nasmyth's membrane in the sulci and the approximal spaces of the teeth give ready starting points for the lodgment of food material, which furnishes an excellent pabulum for the growth of bacteria. Thick, felt-like masses of acid-forming microorganisms may be seen at these places adhering to the surfaces of the teeth. This mass of fungi is so dense and adhesive as to make it highly improbable that the enamel is affected, except in rare or special instances, by any acid other than that which is excreted by the bacteria at the very point where they are attached to the enamel. This thick, gelatinous-like mass of fungi also prevents the excreted acid from being washed away, so that it exerts its full chemical power upon calcific tissue.

The decalcified enamel and dentin often do not break down directly. Caries may advance rather deeply before the formation of a cavity occurs. The progress of destruction is probably depending upon the organism present or rather upon its acid-producing capability.

Miller separated twenty-two different species of bacteria from the human mouth, sixteen of these brought about an acid reaction, some others possessed the power of converting sugar into lactic acid, some other forms produced gases, etc. He was able to produce artificial caries in all its phases by using mixed cultures from the mouth, but failed to attribute this power to a single organism. Caries undoubtedly results from a mixed infection of fungi. In a recent paper Williams describes a new organism which he found almost constantly present in the oral cavity, more so in healthy mouths even after fair sterilization. The same bacterium has been described by Vicentini of Naples, Italy, and is called by him "*Leptothrix racemosa*." By ingenious microscopical methods Williams succeeded in completely demonstrating the different stages of spore-formation of this organism. By exhausting the pabulum and by changes of the surroundings the morphology of certain species may be altered to such a degree as to exhibit entirely new forms which may lead to misconception on the part of the observer. The belief that there are far fewer bone species of bacteria than have been catalogued has steadily gained ground among botanists and histologists, if not among pathologists. The assertions of Dr. Williams may lead to very far-reaching conclusions and are seemingly incomprehensible if based upon our present conception of bacteriology.

By the dissolution of the enamel a gateway is opened to the invading bacteria upon the less resistant dentin. Caries progresses in a cone-shaped form, the apex being pointed towards the pulp. In mounted sections of well-developed caries we may be able to define four distinct zones. The first or outer layer is the so-called transparent zone. It is only found in teeth with life pulps, never in replanted teeth or in artificial caries. This seems to point to the fact that some vital process from within the tooth is connected with the phenomenon. Miller indorses Walkhoff's theory, viz: an increased activity of the cells which results in an overproduction of intercellular substance. Transparency is an optical phenomenon; it merely indicates that two mixed substances have the same angle

of refraction and are therefore penetrated by the rays of light. Black objects to the vital reaction; to him this change is the first stage of reorganization.

Wellauer claims: No caries without transparency. It seems plausible to accept Walkhoff's theory: the lumen of the dental tubuli is reduced by calcification and the per cent of lime salts of the dentin in this zone is increased as shown by analysis. Nature seems to build a barrier towards the advancement of disintegration. Clinical experience verifies this fact. Transparency as well as pigmentation is merely secondary in the progress of caries. The latter may be coincidental either with chromogenic bacteria or with food-material which lodges in the cavity. All stages from light yellow to black are observed; the quicker the advancement of bacteria the less pigmentation.

At present we must admit without doubt that the destruction of dentin is a chemical process, viz: a decalcification by an acid. Carious dentin has lost more than two-thirds of its unorganic constituents. The decalcification is more pronounced in the periphery, lessening towards the apex. A well-defined microscopical picture will show the central caries penetrating the enamel and spreading laterally in the dentin and towards the pulp. Bacteria are usually smaller than the lumen of the dental tubuli; hence the latter offer a ready gateway for their advancement. This shifting forward is not necessarily equal in all directions, it is materially influenced by the resistance of dentin-molecules. The superficial layers of softened dentin are filled with bacterial forms; the deeper layers of softened dentin are not infected. The decalcification precedes the invasion of the bacteria themselves into the dental tubuli. This is a most important point in consideration of its clinical value. Such dentin has evidently not lost its entire vitality; it is often hypersensitive. Furthermore, a thin layer of such dentin, if left over the pulp impregnated with some strong antiseptic, will give no rise of recurrence of decay. It might even be and seems to be verified by clinical demonstrations, that the once-softened but uninfected dentin may reconstruct itself. By observing slides under high power one finds the dental fibrillæ often obliterated, loose fragments surrounded by cocci are seen here and there. Cement caries progresses very much the same as in dentin. Sharpey's fibres are first affected and the bacteria follow the path of these fibres.

After having briefly passed over the more important facts of the pathological changes in the tooth substance, we may now consider for a few moments the predisposing causes of caries. From Miller's explanation of the phenomenon which has been so masterly supplemented by Williams' beautiful microphotographs, we know that the conditions in regard to the predisposing causes of caries must be sought for in the tooth itself or in its surroundings. Structural defects of the enamel, viz: fissures, pits or defects of form of the tooth, will offer ready spaces for retention of food particles. Irregular position of individual teeth may also help in forming places for lodgment. According to Black's investigations we find that there is practically no difference between so-called hard and soft teeth in regard to the quantity of lime salts; the molecular arrangement of the calcium deposits in the matrix of the tooth is *the* factor. The color of the teeth, which is an optical result of crystallization, is only of indirect value; the denser the adhesion of enamel molecules, the more shiny the surface, the greater the resistant power.

The question of vitality of dentin as a factor in the process of caries is the fulcrum of the followers of the theory of inflammation. Dentin has no circulation and no connective tissue fibres, the two fundamental principles for a support of this theory. The only source of vitality in dentin is traceable to Tome's fibres and Neumann's sheaths. But very lately Dr. Roemer has been able to demonstrate without doubt for the first time non-medulated nerve-fibres in dentin, and these nerve-fibres are found to be strictly identical with what has been regarded till now as two different structures, namely, the above mentioned Tome's fibres and Neumann's sheaths. These fibres radiate from the coruna of the pulp towards the junction of the enamel and dentin, ending in club-shaped end-organs which help to explain the increased sensitiveness in those particular regions. A direct formative action in the dentin proper is excluded. Secondary dentin may be formed in the pulp chamber as a result from irritation upon the odontoblasts. The prolongations of the odontoblasts are the linings of the dental tubuli. The transparent zone which is a distinct feature of carious dentin in live teeth owes its peculiarity probably to the same origin which causes the transparency of senile dentin.

The surroundings of the teeth as predisposing factors of caries are of marked importance. As stated above, our daily food, more so the

carbohydrates, furnishes an abundance of pabulum for the growth of microorganisms. The physical conditions of the food-material, viz: hardness, grit and acidity, may exercise their deleterious influence upon the enamel. The secretions of the mouth have been looked upon suspiciously. Chemical analysis of normal saliva does not point to anything which might be dangerous to the teeth; per contra, we believe it possesses some anti-bacterial power which manifests itself; in fact, that those teeth which are constantly bathed in this fluid are practically free from caries. This is not due to its mechanical cleansing, but we know that lesions of the oral cavity heal very quickly in spite of being an incubator for microorganisms.

Amongst practitioners we find an almost general preconception in regard to predisposition of caries during pregnancy. To Dr. Bird of Budapest is due the credit of substantially ratifying this dogmatic presumption. From a large series of statistical examinations of non-mothers, and mothers having been married one or more times, he arrives at the surprising conclusion that pregnancy and caries are in no direct relationship whatever and that pregnancy does not exercise a favorable influence upon the occurrence of this disease. It seems so very plausible that during gestation the lime salts which are needed for constructing the osseous system of the foetus are resorbed from the teeth. But why nature should pursue such a course was never explained. Would it not be simpler to assimilate a greater percentage of the lime salts which our daily food furnishes? Even the plainest table supply contains enough calcium to satisfy the wants of mother and child. If there should be an increased need for an organic material the bones of the body will have to suffer the loss; a process of resorption goes hand in hand with inflammation, which may occur in bone but never in teeth. Hyperemesis during gestation has probably certain bearings on the rapidity of the carious process, but this depends on various circumstances.

Besides the above-named factors as predisposing causes of dental caries, there are a variety of unknown forces, as for instance, chemical changes within the cells of the individual in certain periods of life, viz: the climacteric age of the female which may cause a sudden destruction of a perfect denture which has escaped the disease for two or three deceniums. The last score of years has brought much light upon hitherto unknown fields of scientific dentistry. Still many of the conditions in regard to cause and predisposition of

caries are at present veiled in obscurity, and I beg to close my few remarks with a sentiment chosen from the pen of the genial Dr. Williams:

"These fluctuations in decay of the teeth which we have so long observed are due not to changes in tooth-structure, an hypothesis which could never be held for a moment by those who understand how slow the changes in dentin are and how impossible any true physiological change in enamel must be, but to changing conditions of the environment of those microorganisms which constitute the sole exciting cause of dental caries."—*Ohio Journal*, Sept., 1899.

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INTERESTING SUPREME COURT DECISION. Mrs. J. M. Walker. In the 60th North Carolina Reports (Winston's) there is on record a decision rendered at Richmond Hill, December 3, 1863, by a judge of the Supreme Court, which is of interest to all dentists. It appears that John W. Hunter, a dental graduate of 1856 from one of the dental colleges in the state of Pennsylvania, claimed exemption from army service on the ground that being a surgeon-dentist he was a physician, and therefore exempt by act of Congress. Owing to the dearth of paper and other printing materials at the time and in the place where this decision was rendered, it never had newspaper publication, and was given to the dental profession for the first time by Dr. J. A. Chapple, of Atlanta, at the recent meeting of the National Association at Niagara Falls.

An act of Congress exempting from army service "all physicians in the actual practice of their profession," the questions arose, What constitutes a physician? and does the term "physician" embrace a surgeon-dentist? The record gives an exhaustive study of the derivation and definition of the word physician, including surgeon; the question was reduced to this: "Does a surgeon-dentist come under this definition, or is he a mere mechanic who cleans, plugs and extracts teeth without the aid of science?" The question being a new one, the case was adjourned and evidence taken as to the course of instruction in dental colleges, and the knowledge which it was necessary to acquire in order to obtain a diploma and practice with skill.

The conclusion of the learned judge, from the depositions filed, is given in these words: "I am satisfied that a regular graduated dentist is a 'physician.' . . . If a tooth has to be extracted, the

'surgeon-dentist' by his knowledge of 'physiology' ascertains the condition of the system, and by his knowledge of 'materia medica' administers the necessary alteratives to put it in proper condition. By his knowledge of 'anatomy' he finds how the tooth is inserted in the jawbone, and knows what instrument will extract it with as little pain as possible and without injury to the bone, and the depositions state that frequently 'surgeon-dentists' are called on to perform delicate operations on 'the facial parts' (the upper and lower jawbones) which require an intimate knowledge of the structure of the bones and the localities of the arteries, veins and nerves. In short, the teeth being more subject to decay and disease than any other part of the human body, I am satisfied not only that regular, educated dentists are physicians, but that the human family are much indebted to them for confining themselves to a 'specialty,' that is one branch of the profession, whereby that which was some years ago a mere mechanical art has become a useful and important science. It is therefore considered by me that John W. Hunter be forthwith discharged with leave to go wherever he will."—*Dental Brief*, Oct., 1899.

TO PREVENT PLASTER FROM ADHERING TO FLASK.—Dr. Buckland paints the inner surface of flasks for vulcanite work with a solution of whiting, which allows the plaster to be removed easily and protects the flask from corrosion.

DEEP AND SURFACE TEMPERATURE OF THE HUMAN BODY.—M. S. Pembrey and B. A. Nicol (*Journal of Physiology*, vol. xxiii, p. 386) give the results of a large number of observations made upon the deep and surface temperature of healthy persons under various conditions. The following are among the most important results obtained: 1. The average rectal temperature for the twenty-four hours is 98.2 deg. F.; that of the urine is 98.6 deg. F. 2. The average for the time of activity (7 a. m. to 11 p. m.) is 98.5 deg. in the case of the rectum, 99.1 deg. in the urine; the respective values for the period of rest (11 p. m. to 7 a. m.) are 97.4 deg. and 97.6 deg. 3. The maximum daily temperature is reached about 6 p. m., the minimum about 2 a. m. 4. Muscular exercise produces a marked rise in the internal temperature; mental work has very little influence, while rest and sleep cause a decided fall. The latter, indeed, is the most important factor in producing the fall in the curve of daily temperature. 5. Food produces a slight rise in temperature. 6. The temperature of the rectum shows an average excess of 1.1 deg. F. over that of the mouth. The latter is not an exact measure of the deep temperature; it is unreliable, especially after severe exercise or in cold weather. 7. The surface temperature of the skin of the parts covered by the clothing is fairly constant.

Letters.

NEW YORK LETTER.

NEW YORK, Oct. 20, 1899.

To the Editor of the Digest,

MR. EDITOR:—To call Dr. Bonwill dead seems almost a misnomer, but physical beginnings must have physical endings. No man since Atkinson has had a record like Bonwill's, or one more fruitful. We have regarded him as a human model of energy, both physical and mental, and to say that he has been a blessing to his calling is but meager praise.

"Old Member" who criticizes the meetings at Niagara sounds rather familiar. If we were asked to guess who he is we should say that he belongs somewhere in the central part of New York state, for the pessimistic tone is like most things which come from the pen of a gentleman in that region. We think, however, that there is some truth in what he says about society meetings.

A recent copy of *The Weekly Dentist* (London) gives a spicy resume of independent journalism as outlined in American journals, and it is enjoyable reading, quite.

One hundred and twenty-five millions and Cornelius Vanderbilt have parted. We bring nothing into this world and we carry nothing out. Mr. Vanderbilt left a good name which is better than all his riches.

We often wonder who are the dentists of families like the Vanderbilts, for people of such wealth are able to employ the best ability. Wealth does not always secure it, however. We were told by a good practitioner recently that he had one of the financial kings of this city for a patient, "but," said he, "I am not able to do him justice, for he seems to distrust me, fearing that I will take advantage of his ability to pay. This is due to his long habit of suspecting that every one wishes to get the best of him."

Too often we meet with an operation that must be condemned, namely, what is called a "socket crown," partially covering a sound and perfect tooth used as an attachment for carrying a dummy crown. There is a false idea conveyed by saying that this "cemented on" protects the tooth from decay," for it often proves a cesspool of the most destructive nature. We have seen beautiful

cuspidis literally dissolved by such "sockets." One great fault is that they cover too much of the tooth. Probably ninety-nine cases in a hundred that are cemented soon become separated from the sealed contact by the movement of the teeth, and only under the best sanitary conditions can they become immune from quick dissolution. We would not wholly condemn the practice, however.

In the September *Harper's* Mark Twain writes "Concerning the Jews," in which he takes up the defense of Satan, being quite inclined to think that he is a too much abused person. The article does not reveal any decline in Mr. Clemens' giant ability, although he is not so young as he used to be, and has passed through the ordeal of bankruptcy with honor, a feat that very few, alas, are able to accomplish.

The late Dr. Riggs told us the following experience which he had with the author when he was a resident of Hartford. Mark Twain had a clerical friend who had been in Dr. Riggs' hands for special services, and when he told of the peculiarity of the disorder connected with his teeth Twain concluded that what was good for his friend might be good for him. After the operation he asked the clergyman how much it had cost him, and when he learned that the work had been done free of charge Twain remarked that the same "donation party" methods would have to apply in his case, as the dentist had certainly spoiled his teeth, for while the seat of the disorder might have been reached, he would wager that his teeth would all drop out. He therefore did not pay Dr. Riggs' claim against him, but went to Europe for a two years' trip. On his return he visited a dentist well known in New York state, as he had more trouble with his teeth, and was made acquainted with the fact that he had "Riggs' disease." This recalled to his mind that he had been told something of the kind before, and he related his former experience. The dentist then told him that he had great cause for gratitude, "For the present condition of your mouth indicates that you would have no teeth if you had not been under the care of so skillful an operator." Mr. Clemens was advised to call on Dr. Riggs for further treatment, and after his friend had explained the case he did so. He apologized to Dr. Riggs, paid the bill, and the best of feeling existed between them afterward. Many people do not realize that the treatment of pyorrhea takes skill and must be paid for, even though they can see no benefit.

Another anecdote is told of Mark Twain. When the subject of cremation was discussed he asked his clerical friend to see to it that he was cremated in case he should die before the other did, and his friend replied "Clemens, don't give yourself a moment's anxiety over this matter. I have not the slightest doubt but that you will be faithfully cremated, for it is so written."

At one of the recent curbstone conventions sincere regret was expressed that there is such a wide breach in New York society matters, and it was admitted that there seems no probable solution of the problem. Men have so alienated themselves from their fellows that the abyss will never be bridged in this generation. We can get "Fellowship" in alloy but not in human nature.

One of the most energetic societies in this country is the Central Dental Association of Northern New Jersey, and its regular monthly meetings are most enjoyable and profitable. A good program is arranged for the winter.

Cordially,

NEW YORK.

BUFFALO LETTER.

Dear Digest,

BUFFALO, Oct. 19, 1899.

With the autumnal coloring comes increasing activity in our socio-professional gatherings. Already the staunch Eighth District Society has started on its campaign of education. We make a splendid sounding-board from which to reflect things of professional interest or utility.

But when asthmatic tones of the hawker peddling his wares goes up against us, biting frosts are apt to impair our resonance. Still, "musty cabinets" must be formed to hide all vulnerable points against microbe colonization (that chap with a combination name from the Sanscrit Greek and old Saxon).

Our Buffalo school has opened with a long list of sacrificial offerings upon dentistry's altar. Pa Nam can safely vouch for the quality of the material offered, for he knows absolutely nothing about it, but Uncle Willie can speak of the matter with authority and pride.

A few days since we met one of our never-improve-his-surroundings-behind-the-procession dentists. His tale of woe centered in a final outburst of denunciation against the numerous "Painless Parlor" and the "crowds of unqualified boys" who settle here and rob him of his rights. These early settlers have queer notions of a

man's rights in a truly democratic country, and remind one of the sparrow who fainted on seeing an automobile, because he thought the horseless carriage would bring him face to face with starvation. This is an old story, but we think it aptly illustrates the cramped limitations of personal resources so often met with.

The recent decision on the crown and bridge patents has caused a nervous shifting of feet in this end of New York state. Doubtless "there are others." An editorial in the October *International* covers the ground well and points out very clearly the duty of every dentist, besides paying well deserved praise to the Dewey of the dental profession. We wonder what proportion will pinch the price of protection and still hope to remain immune from grasping greed by virtue of a neighbor's financial vaccination.

The union meeting of the 7th and 8th Societies always attract wide interest in this part of God's country. The recent gathering at Rochester for the thirty-second united effort of these two bodies in disseminating dental culture was highly successful. The papers presented were on the whole commendable, but the genuine literary worth of individual efforts but poorly covers the ground for the general good. They are only stepping-stones. The discussions, the social intermingling, the friendships begun, which often run through life, all establish an *esprit de corps* among us, the strength of which can be expressed only in the Frenchman's language.

Yours,

PA NAM.

DISINFECTION AND THE DISINFECTING POWER OF THE SKIN.—Dr. R. Binaghi (*Centr. f. Chirurg.*), as a result of many experiments, found that after an ordinary cleansing of the hands, followed by simple drying, the number of bacteria was invariably increased (due, doubtless, to the softening of the outer layers of epidermis). After washing in soda solution and repeated rubbing with a dry, sterile towel, the number of bacteria was lessened; also after soaping and scrubbing; also after washing in alcohol or ether. As disinfectants the following agents gave the best results: Corrosive sublimate, 1 in 1,000; carbolic acid, 5 per cent; and potassium permanganate, 1 per cent. A simple long-continued washing with any one of these solutions (without previous preparation) never sterilized the skin. For complete sterilization the author recommends the following procedure: 1. Wash and scrub in warm soap and water. 2. Wash in warm alkalin solution (soda or soda carbonate 5 per cent). 3. Sterilized water. 4. Rub with sterile towel. 5. Alcohol or ether. 6. Warm sublimate solution, 1 in 1,000. This invariably produces sterility of the hands.

The Dental Digest.

PUBLISHED THE TWENTIETH DAY OF EVERY MONTH

At 2231 Prairie Avenue, Chicago,

Where All Communications Should be Addressed.

Editorial.

THE PROTECTIVE ASSOCIATION AND THE CROWN CO.

Since the September number of the DIGEST was placed in the hands of our readers there has been a general awakening of the profession to the necessity of taking immediate action to resist the encroachments of the Crown Company. Having secured a favorable decision from a court of record, that menacing organization is technically, at least, in a position to proceed against every dentist in the United States. If one should judge solely from the *ex parte* statements of the Company's lawyers, there would be no question of their ability to exact tribute in the form of royalty for every piece of crown and bridgework the dentists have done. Our own opinion, based on the advice of the Protective Association's lawyers and on our knowledge of the matter, which has been many times expressed in these columns and elsewhere, is that the patents held by the Crown Company and upon which they are attempting to collect royalty and license fees, can be successfully combatted in the courts.

It is not necessary to recount the previous litigation and to show that the Crown Company have never won when a case was properly contested. The decision they are now attempting to enforce was not obtained through any inherent strength of their position, but through a questionable suit in which the Protective Association could not be represented, and therefore no adequate defense was made. It was practically a judgment by default. We are thoroughly familiar with every detail of the litigation, and assure the profession in the most unequivocal terms that no member of the Association shall be forced to pay royalty.

By circulars and in the columns of this journal the dentists of the country have been informed of the danger which confronts them, and have been shown the safety that is afforded by organization and cooperation. Most of the members in arrears have hastened to pay their assessment, many new members have joined, and hundreds of

letters have been received evincing a lively interest in the work. We are encouraged by the results thus far obtained and feel sanguine that the profession is rapidly shaking off its apathy.

The lack of cohesion and *esprit de corps* that made the present condition possible is well exemplified by a remark made some years ago by an officer of the Crown Company. He said: "The dentists never pull together, so it is just as easy to collect royalty on a poor patent as on a good one." The Company is a close, compact working organization, and its managers very shrewdly estimated that they could succeed in mulcting the dentists, because they were segregated and unorganized and had not continued to support the Protective Association.

Fortunately, this condition of indifference and disorganization has given place to interest and cooperation, and it would be putting the case very mildly to state that the profession is thoroughly aroused. The members of the Association throughout the country are aiding in the work by inducing those around them to join. In many of the larger cities mass meetings have been called by friends of the Association, and the facts in the case were so clearly set forth that the non-members felt it was their duty to join the ranks. In other instances the members have sent circulars to every dentist in their state, which has resulted in largely increasing the membership. If these examples were followed in other cities and states the membership could be quadrupled.

Some idea of the development of sentiment favorable to the Association is furnished by the change of front of several dental journals which have hitherto been inimical to the organization. Many of them have commended the work and in some cases have advised their readers to apply for membership. This is a good thing for the Association and a wise move on the part of the journals, for the members of the dental profession are now in a mood to appreciate who are and who are not their friends.

The colleges, generally speaking, in the past have been friendly to the Association, but have not given it the active support which it deserved. We are glad to say that now, however, several of the colleges are advising their alumni to join, and one college in particular has already collected and sent in the membership fees from its graduates.

While we wish to express our satisfaction with the great progress

the Association has made, we would warn our readers against underestimating the strength and aggressiveness of the enemy. Several of the most prominent dentists in Boston have already been dragged into court by the Crown Company, and U. S. marshals, politely called "keepers" by the company, have been placed in their offices. This was ostensibly to insure collection of the royalties, but really to coerce the dentists into settling rather than be subjected to the disgrace of having custodians ornamenting their operating-rooms.

These same dentists were sued for sums which aggregated forty-five thousand dollars and in some cases their property was attached. As these men were members of the Protective Association, we promptly furnished a bond and had the obnoxious receivers removed from the offices. The Association also immediately assumed defense of the suits and the lawyer who has won all our cases in the past was promptly dispatched to the scene of trouble.

This extreme procedure of the Crown Company was the resort of desperation following the failure of the ordinary means of effecting settlements. The officials evidently expected to stampede the members of the Association. They hoped under the stress of excitement to force settlement with a few prominent dentists, and having thus established a precedent it would have been easy to induce others to pay up rather than stand suit.

Their plans having ignominiously failed of successful accomplishment, it becomes necessary for us to form some opinion as to the probable course the Company will now pursue. They have some perception of the strength of the defense which we can make, and cannot have failed to notice the recent circular, wherein it was stated that the Association would defend any dentist who joined before December 1, 1899, but would not protect those who waited until after that time. We believe the Company will remain passive until that date, trusting that a considerable number of dentists, lulled into a feeling of security by this same inaction, will not avail themselves of the proffered protection, and by reason of their inertia will soon be absolutely at the mercy of the Company. We venture this prediction because it is evident that a vigorous policy on the part of the Company at this time will continue to have the effect of causing the dentists in increasing numbers to join the Association.

We hope the profession will not be misled by any apparent diminution of activity on the part of the Crown Company, for they are

determined to collect royalty of every one who has done crown and bridge work. We feel justified in limiting the time during which the Association will accept members or defend any members who are in arrears for their assessments. The endless details in the work of organization are exhausting and occupy so much time that we must bring them to a close, as all our energies should be devoted to the litigation and defense of suits, for we cannot afford to carry on the fight in a desultory manner. Ample warning has been given, and those who delay joining this Association for mutual defense must accept the consequences of their procrastination.

BLOWING HOT AND COLD.

The editor of the *Dental Review* continues to inflict his dual personality upon his readers. In a curiously composed article in the October issue he gets into an animated argument with his subconsciousness that is quite amusing. The editor has probably been *requested* by the powers that be to commend the Protective Association, but instead of repeating his lesson like a good little boy, he mixes duty and inclination up in a most confusing manner. His attitude reminds one of the Maine deacon who, in speaking of the prohibition question, said he was "in favor of the law but agin its enforcement." As an example of how a man may blow hot and cold in one breath we have selected a few phrases from the *Review's* editorial, and have divided them into hot and cold. It should be noted that these sentences are all taken from *one* article:

HOT.

"Our esteemed and versatile friend the editor of the DENTAL DIGEST. . . . By all means join the Protective Association and get the benefits to be derived from membership. . . . We belong to the Association and have for some years. . . . We think he (the chairman) is the right man in the right place; we think that he will do all he promises."

COLD.

"What does the editor of the DIGEST want? . . . The crown case is not the whole of life, indeed it is a small part of it. . . . After reading the editorial about the crown case in the DIGEST, is it any wonder that a decent dental editor would keep silent on this matter? . . . It is not pleasant to see from month to month tirades from the head of the Protective Association."

"SOME INSIDE FIGURES."

[This editorial appeared in the September issue, but we have had so many requests for extra copies that it seemed best to republish it.]

Trusts are usually secretive. They shun the light of publicity and prefer to work in dark and devious ways. At the trust conference recently held in Chicago, under the auspices of the Civic Federation, while all phases of the evil were discussed, there seemed to be a general belief that complete publicity of accounts, operations and methods, enforced by government inspection and supervision, would make these mammoth combinations powerless to plunder the public. It may be that the managers of the dental trust are becoming alarmed at the spread of anti-trust sentiment and have shrewdly decided that a voluntary exposition of the affairs of the company, carefully drawn up from the inside, would be better than an enforced showing made by a public official from the outside. However this may be, we notice that all the dental journals controlled by the trust contain an alleged statement of the affairs of the S. S. White Dental Manufacturing Company. The company purports to give "some inside figures" regarding its operations, but after reading the statement we fail to find any facts of value to the profession. The "inside figures" are merely an egotistical boast of bigness, and are more remarkable for what they conceal than for what they express. The reader is informed how many million teeth are carried in stock, the number of employes on the pay-rolls, and is expected to contemplate with awe the elephantine proportions of the combine.

We are of the opinion that every dentist who is a purchaser of supplies would be better and safer in the practice of his profession if the manufacture and sale of these articles were not so nearly controlled by one large concern. We quote from the circular as follows:

"If the company should retire from business, or turn its attention to other branches of manufacture, there would be a great void in the dental supply business that it would take years to fill. It has taken two generations of hard, faithful work to place the house where it stands to-day, and for all that are in the business outside, it would probably require at least another generation to fill the gap and to supply the profession as well and as completely as it is supplied by us to-day."

Is this a veiled threat, or merely a piece of rhetorical bombast? Does the trust wish the dentists of the United States to understand

that they are absolutely dependent upon a single corporation for the supplies necessary to carry on the great work of the profession? Stripped of its verbiage this paragraph means: "We've got you where we want you. You can't get along without us. What are you going to do about it?"

The claims of the dental octopus are of course greatly exaggerated. It is almost impossible to destroy competition and no dentist needs to be informed that he can, if he so desires, obtain anything in the form of supplies in any quantity at short notice from a concern that is not only outside the combination breastworks, but is distinctly and defiantly opposed to trust methods.

To calm the perturbed bosom of any dentist who may have become alarmed lest the S. S. White Co. may suddenly stop, bringing the entire profession to immediate chaos, we have been requested by the directors of the Dental Protective Supply Co. to state that they are prepared to give a bond of \$5,000,000, in the event of the withdrawal of the trust, that ample supplies will be forthcoming. If the combination should abandon the field the only loss would fall upon its salaried officers and the army of trust beneficiaries in all parts of the country. The profession at large would welcome an era of free competition in dental supplies—an era in which merit would win and honorable methods would prevail, but there is not the slightest danger of the big combine voluntarily going out of existence. It may die a violent death, but it will never resign.

It is well enough to parade figures showing the magnitude of operations and the amount of business done, but some data describing how this immense traffic was built up would be more acceptable. We are not told how many competitors have been crushed, how many inventions have been suppressed, or how many educators and editors have been subsidized. While giving its "inside figures" the trust should have explained how it has sought to create a monopoly by mythical patents that will not stand examination. Patents of minor importance are paraded as vital and the combination seeks to coerce where it has not the legitimate power to control. Statistics upon these points would be of absorbing interest to the profession.

Several paragraphs of the trust circular are unworthy of serious consideration, but we cannot refrain from alluding to this sentence: "We are not Ishmaelites, and have not been warring upon anybody

or pulling wires for position." Think of it, the managers of the dental trust have never done any wire-pulling. They have never subsidized prominent men, terrorized patentees, fed trust pap to the editors of dental journals, or indeed done any of the devious and unexplainable things that other trusts are so frequently charged with. An honest trust is the most remarkable creation of modern times.

Notices.

WEST VIRGINIA DENTAL ASSOCIATION.

At the annual meeting of this organization, held Oct. 4-5, 1899, the following officers were elected: President, J. H. McClure; Vice-President, G. B. McNeely; Secretary, John W. Storer; Treasurer, W. K. Cummings.

SOUTHERN CALIFORNIA DENTAL ASSOCIATION.

At the annual meeting of this organization, held Oct. 4, 1899, the following officers were elected for the ensuing year: President, H. R. Harbison; First Vice-President, L. N. Bedford; Second Vice-President, Emma T. Reed; Treasurer, J. M. White; Secretary, L. E. Ford.

FIRST DISTRICT DENTAL SOCIETY OF ILLINOIS.

At the seventeenth annual meeting of the First District Dental Society, held Sept. 26-28, 1899, the following officers were elected for the ensuing year: President, W. J. Adams; Vice-President, T. F. Henry; Secretary, A. G. Smith; Treasurer, C. B. Warner; Executive Committeeman, W. E. Maybee.

NORTHERN ILLINOIS DENTAL SOCIETY.

At the meeting of the Northern Illinois Dental Society, held at Elgin, Oct. 18 and 19, the following officers were elected for the ensuing year: President, O. A. Chappell; Vice-President, J. W. Stephens; Secretary, M. R. Harned; member Executive Committee, F. F. Bell. The next meeting will be held at Aurora.

OHIO STATE DENTAL SOCIETY.

The thirty-fourth annual meeting of this society will be held at Columbus, Dec. 5-7, 1899, at the Great Southern Hotel. A full program of papers and clinics has been arranged for, and a very profitable meeting is assured. The profession in this and neighboring states are cordially invited to be present.
S. D. RUGGLES, Sec'y, Portsmouth, O.

NORTHEASTERN DENTAL ASSOCIATION.

At the meeting of this organization, held at Holyoke, Oct. 17-19, the following officers were elected for the ensuing year: President, Waldo E.

Boardman; First Vice-President, A. J. Flanagan; Second Vice-President, G. A. Lowe; Secretary, Edgar O. Kinsman; Assistant Secretary, F. M. Wetherbee; Treasurer, J. T. Barker; Librarian, F. T. Murlless, Jr.; Editor, Charles McManus. The next annual meeting will be held at either Worcester, New Haven or Providence.

The work of the Protective Association was commended throughout, and the utmost confidence was expressed that the Association would take care of its members faithfully in all litigation that might come.

ILLINOIS STATE BOARD OF DENTAL EXAMINERS.

At the recent meeting of this organization, held at Springfield, Sept. 30 1899, the following resolution was unanimously adopted:

"Resolved, That no examination in the future will be held by this board in any other than the English language."

A diploma from the Academia Illinois was presented to the board, and was handed to the attorney general. Steps will be taken to revoke the charter of this institution.

The board wishes to state that it recognizes the diplomas of the Dental Department of the Milwaukee Medical College, and that the report which was circulated recently to the contrary was erroneous.

The board has added to its curriculum of examination three more subjects—chemistry, bacteriology and oral surgery, making in all thirteen branches, including the ten already on the list, which are: Anatomy, materia medica, therapeutics, toxicology, physiology, pathology, operative dentistry, prosthetic dentistry, metallurgy, histology and embryology. Hereafter a clinical as well as a theoretical examination will be held.

LATEST DENTAL PATENTS.

- 632,843 Dental forceps, Nicholas B. McGhee, assignor of one-half to M. Lash, Orange, Cal.
- 633,071 Artificial tooth, John S. Campbell, Paris, France, assignor to Dentenax (Holdfast) Tooth Co., Limited, London, England.
- 633,135 Dental cuspidor, George P. Davis, assignor of one-half to T. D. Wilson and E. J. Cousins, Toronto, Canada.
- 633,128 Artificial tooth, Freidrich Ernst, Hamburg, Germany.
- 633,222 Method of and apparatus for casting dental aluminum plates, Willard Streetman, Cleburne, Tex.
- 633,390 Automatic disinfector, John W. Schell, Philadelphia.
- 633,859 Blowpipe, Theodore G. Lewis, assignor to Buffalo Dental Mfg. Co., Buffalo, N. Y.
- 634,083 Head-rest, Aaron P. Gould, Canton, O.
- 634,084 Dental chair, Aaron P. Gould, Canton, O.
- 634,638 Attachment for dental mirrors, Walter I. Brigham, South Framingham, Mass.
- 634,639 Machine for making toothpicks, Edward M. Lamb and E. Bales, Adrian, Mich.

634,731 Tooth clamp, James W. Ivory, Philadelphia.

634,732 Fastener for dental instruments, James W. Ivory, Philadelphia.

Copies of above patents may be obtained for ten cents each by addressing John A. Saul, Solicitor of Patents, Fondall Bldg., Washington, D. C.

News Summary.

J. W. FOOTE, a prominent dentist of Christiansburg, Va., died suddenly Sept. 29, 1899.

J. A. KINGSBURY, a dentist of White Pigeon, Mich., died from paralysis Sept. 19, 1899.

FRANCIS B. SMITH, formerly a dentist of New York City, died at Stowe, Vt., Sept. 23, 1899.

TO RETAIN COLOR.—In some mouths platinoid discolors; this is obviated by flowing 14-carat gold solder over it.—*Dental Hints*.

JOSIAH RAMSEY, the oldest dentist in Springfield, O., died Sept. 27, 1899, from pneumonia, at the age of 84 years.

JOHN W. GIBBS, a dentist of Alton, Ill., died suddenly Sept. 29, 1899, at the age of 63 years.

WM. G. A. BONWILL, the late Philadelphia dentist, has left much of his property to museums of science.

BENJAMIN WHEELOCK, a young dentist of Seattle, Wash., died of consumption at Pasadena, Cal., Oct. 7, 1899.

E. G. HAZLETON, a dentist of thirty-two years' practice in Kenosha, Wis., died at that place Oct. 23, 1899, at the age of 55 years.

PRACTICING DENTISTRY WITHOUT A LICENSE has caused the arrest of a dentist at Flanagan, Ill., another at Goshen, Ind., and two at Gloucester, Mass.

DETROIT DENTAL SOCIETY gave a very enjoyable dinner at the Russell House, Oct. 9, about fifty dentists being present. The toastmaster was Dr. N. S. Hoff of Ann Arbor.

SOUTH JERSEY DENTAL ORGANIZATION.—The dentists of Camden have organized a society with the above title. Dr. J. E. Duffield was elected temporary chairman and Dr. W. E. Crate secretary.

CHEERFUL.—"Of all the delegates that I met at that Christian Endeavor Convention," said Dr. Hill, "I liked him best who, on being asked what his business was, said, 'I am a cheer-up-odist.'"—*Success*.

ARTICLES BY J. N. CROUSE.—Beginning with the January, 1899, issue, we shall publish a series of articles by Dr. Crouse on "Methods of Establishing and Conducting a Practice, with Special Reference to Fees."

TOLEDO DENTAL SOCIETY.—The first regular meeting for the winter of this society was held Oct. 13, and the following officers were elected for the ensuing year: President, Dr. Kuebler; Vice-President, Dr. Cook; Secretary and Treasurer, Dr. Canfield.

FAITH AND MIND CURE.—Chas. Dudley Warner says that the difference between the "faith cure" and the "mind cure" is that the mind cure does not require any faith and the faith cure does not require any mind.

NEWSPAPER ACCURACY.—According to the *Kansas City Gazette*, an Osborne dentist pulled two hundred and twenty-seven teeth in two minutes. Yet we wonder that the laity has erroneous ideas concerning dentistry.

CONSCIENTIOUS.—Coroner—Was the victim conscious when you reached him?"

Pat—Yis, sor, he worr. But bechune us, I don't believe he knew ut."

LOSS OF A TOOTH CAUSES DEATH.—A man in South Orange, N. J., had a tooth extracted recently, and the wound did not heal readily. A short time after his jaw began to swell, and he died Sept. 24, from blood-poisoning.

DENTIST FOR GEORGIA STATE SANITARIUM.—The trustees of this institution have appointed a dentist to look after the teeth of patients at the Georgia State Sanitarium, and we commend their action to other like bodies.

LARGE GLANDS IN THE NECK of adults or old people are very apt to signify that a malignant process is taking place in the neighborhood; hence it is always well to examine the mouth, the tongue, the nose and the throat carefully in such cases.—*Int. Jour. Surg.*

MORE NEWSPAPER FACTS.—According to the *Columbus (O.) Post*, a prominent doctor of Xenia, O., is in a dying condition, due to having some of his teeth filled with alloy. The physician in the case ascribes the illness to poison from the alloy permeating the patient's entire system.

JAMES W. KESSLER, a dentist of Honesdale, Pa., died of apoplexy Oct. 10, 1899, at the age of 57 years. He was clerk for Admiral Dewey when the latter, then a lieutenant, was executive officer of the cruiser "Mississippi," and until that boat was destroyed off Port Hudson, March 14, 1863.

TWO ADMINISTRATIONS OF GAS almost caused the death of a man in New York. One tooth was extracted and the gas was administered for the extraction of another tooth, which was accomplished, but physicians had to work over the patient several hours before he regained consciousness.

PRONUNCIATION.—A series of experiments made by Benno Erdmann and Raymond Dodge show that in normal reading the letters are not spelled out separately and one after the other, but a short word of not more than four letters can be read off in less time than a single letter.—*Scientific American*.

IN OLD SUPPURATION OF THE ANTRUM Fein uses powdered nitrate of silver, which he applies with a blower, designed to eject it in a fine cloud and cover the whole surface with a thin layer. A slight burning sensation follows. The discharge diminishes and other symptoms improve.—*Pacific Med. Jour.*

EVANS' MUSEUM.—It would appear that the protracted litigation connected with Dr. Thomas W. Evans' estate has been finally adjusted, as we learn that the judge presiding in the case has approved the charter of the Evans' Museum. Philadelphia will realize a munificent gift from one of her former citizens.

AMERICAN DENTISTS TO UNITE.—The American dentists of Southwest Germany held a meeting, Oct. 7, at Karlsruhe to form an organization which shall protect the interests of American dentists and advance the science. The German laws governing practice are rigorous, and American dentists have for some time contemplated organizing to protect themselves.

"COMPARATIVE DENTAL ANATOMY."—Under this title Alton H. Thompson, D.D.S., of Topeka, Kan., has written a book covering that subject, at the request of the National Association of Dental Faculties. It has been adopted by that body as a text-book, and as such is being universally adopted by the leading schools of the country. S. S. White Dental Mfg. Co., Phila.

A SEA HORSE is a sea horse
When you see him in the sea,
But when you see him in the bay
A bay horse then is he;
But the serum of a tainted horse
Is sero-therapy.—*Exchange.*

PERTINENT.—A local paper published a long obituary of a man who had died in the community, closing with the statement that 'a long procession of people followed the remains to their last roasting place.' The family read the notice and discovered the supposed error and asked the editor to make a correction in the word 'roasting,' but he said he could not do it until the seven years' back subscription that the decedent owed him had been paid.

EARLY SIGNS OF PHTHISIS.—Dr. John W. Moore says of the relative value—diagnostic and prognostic—of certain symptoms which herald the onset of pulmonary consumption: "The so-called 'tuberculous red line' along the gums may mean much or little. Its absence encourages, but its presence may be due to other causes than tuberculosis. I have seen it in the neighborhood of carious teeth, or where tartar incrusts the crown of a tooth."—*Medical Standard.*

WARTS.—Regarding these unsightly excrescences, a Paris correspondent says: It is now fairly established that the common wart can be easily removed by small doses of sulphate of magnesia, taken internally. M. Colrat of Lyons states, 'Several children treated with three-grain doses of Epsom salts, morning and evening, were promptly cured.' M. Aubert cites the case of a woman whose face was disfigured by warts, and who was cured in a month by one and one-half dram doses of magnesia, taken daily. Another medical man reports a case of very large warts which disappeared in a fortnight from the daily administration of ten grains of salts.—*Practical Druggist.*

"INJURIES AND SURGICAL DISEASES OF THE FACE, MOUTH AND JAWS."—This comprehensive treatise of over 700 pages is the result crowning the labors of John Sayre Marshall, D.D.S., M.D., of Chicago, whose extended experience, both as instructor and practitioner, has especially qualified him as an authority on the subjects treated. The book is of great value to the

dentist and general surgeon, although especially designed as a text and reference book for students. A unique feature of the work is the schedule of review questions following each chapter. It has been unanimously recommended by the committee on text books of the National Association of Dental Faculties. Price: cloth, \$6; sheep, \$7. S. S. White Dent. Mfg. Co., Philadelphia.

TO MAKE PAPER WATERPROOF.—To the physician, especially to the one practicing in out-of-the-way places, the following simple method may prove useful: The German journal *Neueste Erfindungen* describes the following method of making a waterproof paper: The sheet is coated on both sides with a solution consisting of one part gelatin, four parts water, and one part glycerin. When dry, the paper is immersed in a ten-per-cent solution of formalin. After this treatment the paper is said to become impervious even to steam.

ANOTHER PERPETUAL MOTION.—The cat-fur farm was the first success in the supposed impossible; but everyone can see that it was an automatic success. Now comes another genius who has discovered that printed matter reconverted into pulp by soaking in some milk and fed to laying hens increases greatly hen fruit. The brain matter contained in the printed matter, the product of brain work, is so closely allied in composition to the contents of the egg-shell, that it serves as nutritive matter which has a special affinity for the cerebral substance. The editor puts brain into his paper, which the hen consumes as food, and transforms into egg matter; the editor eats the eggs and puts more brain matter into his paper; and so the turning wheel keeps on its course, and the hen and the editor fill the world with intelligence. The fact affords much hope for our future offspring. Another good result will be the marked increased sweetness in the temper and disposition of teachers in the public schools. No more waste printed matter that contains brains should be wasted.—*Ex.*

HUMAN BODY AS A CALORIC MACHINE.—As the efficiency of the steam engine or other machine is considered as the relation of the work performed to the energy supplied to it, it is an interesting question to consider the case of the human system, and to find out what is the relation between the work which an average man is capable of performing and the aliments which he absorbs. A German savant, Ruhlmann, has made some important researches in this direction. He considers the body as a caloric machine, i. e., as a motor in which the energy supplied is represented by the heat developed in the combustion, or rather oxidation, of the carbon and hydrogen contained in the aliments. The combustion of 1 kilogram of carbon develops a quantity of heat equal to 8.08 calories, and that of a kilogram of hydrogen 34.56 calories. A man of average strength produces in the course of twelve hours the oxidation of 0.252 kilogram of carbon and 0.0156 of hydrogen. From this it follows that the heat of alimentation equals $0.252 \times 8.08 + 0.0156 \times 34.46$, or 2573 calories, corresponding, according to the mechanical theory of heat, to 1,094,000 kilogram-meters, this figure representing the energy developed in the system. To find out the average work performed by the individual, we may

takes as an example that of the Alpine guide considered by Dupin. The mean weight of this man was 70 kilograms, the load which he carried 12 kilograms, and the duration of his work 10 hours, each hour corresponding to an ascent of 400 meters. Accordingly the total work which he performed in that time was $82 \times 400 \times 10$, or 310,000 kilogram meters. To estimate the efficiency at which this work was performed, it is only necessary to find the ratio between this figure and that of the energy supplied to the body, as above estimated by Ruhlmann, or $1,094,000 \div 328,000$. This gives us 30 per cent as the efficiency of the human motor. Or, if we wish to admit 25 per cent as a fair average, it is seen that a man gives only 25 per cent of the total energy produced by the oxidation of the aliments, the remaining 75 per cent being expended in internal work. This efficiency, it may be observed, far surpasses that of the steam engine and other similar motors, the steam engine giving on an average only 6 per cent of the energy stored up in the combustible.—*Scientific American*.

A BACTERIOLOGICAL TRAGEDY.

A gay Bacillus, to gain him glory,
Once gave a ball in a laboratory;
The fete took place on a cover-glass,
Where vulgar germs could not harass.
None but the cultured were invited
(For microbe cliques are well united);
And tightly closed the ball-room doors,
To all the germs containing spores.
The Staphylococci first arrived—
To stand in groups they all contrived.
The Streptococci took great pains
To seat themselves in graceful chains.
While somewhat late and two by two,
The Diplococci came in view.
The Pneumococci, stern and haughty,
Declared the Gonococci naughty,
And would not care to stay at all
If they were present at the ball.
The fun began, the mirth ran high,
With not one thought of danger nigh.
Each germ enjoyed himself that night,
With never a fear of the Phagocyte.
'Twas getting late and some were "loaded"
When a jar of formalin exploded,
And drenched the happy dancing mass
That swarmed the fatal cover-glass.

* * * * *

Not one survived, but perished all
At this Bacteriologic ball.

J. Lee Hagadorn, M.D., Los Angeles, in Southern Cal. Practitioner.

PIGMENTATION OF THE MOUTH: ITS RELATION TO ADDISON'S DISEASE.—At a meeting of the Dermatological Society of London, held July 12, Dr. Colcott Fox exhibited a patient, aged forty years, with a remarkable pigmentation of the mouth, which had been developing for four years. The lips, gums and mucous membrane of the cheeks were dotted with very dark, brownish-black, rounded pigment macules, mostly nearly the size of a split pea. They developed without subjective sensations. The man was apparently in perfect health and had a good family and personal history. There was not the slightest suspicion of any adrenal disease or carcinoma. Dr. Stephen Mackenzie remarked that, in spite of the good health which this patient now enjoyed, he should strongly suspect an early stage of Addison's disease. On more than one occasion he had been enabled to foretell the onset of this affection, while the patient was in good health, by the pigmentation of the buccal mucous membrane.—*Medical Age*.

Obituary.



A handwritten signature in cursive script, reading "W. G. A. Bonwill". The signature is written in dark ink and is positioned below the portrait.

DR. W. G. A. BONWILL.

Dr. Bonwill, whose death it is our painful duty to announce, died September 24, 1899, after an illness of six or seven weeks' duration. The disease to which Dr. Bonwill succumbed was prostatic hypertrophy, complicated with acute cystitis and chronic nephritis. For the relief of the obstruction caused by the hypertrophic condition of the prostate gland, two electrical cauteriza-

tions were performed with temporary benefit; but absorption of pus took place, blood-poisoning ensued, and death resulted from septicemia.

William Gibson Arlington Bonwill was born in Camden, near Dover, Del., October 4, 1833. From his seventh to his fourteenth year he attended school in the Middletown, Del., Academy, where his course of instruction included algebra, geometry, chemistry and elementary Latin and Greek.

After leaving school he was thrown upon his own resources, and, after the manner of self-reliant American youth, accepted any honest employment he could find, and was successively carpenter, cabinetmaker, store clerk, pedagogue, and finally student in dentistry in the laboratory of Dr. Samuel W. Neall, of Camden, N. J., where he had six months' tuition. This brief apprenticeship was supplemented by three months spent with Dr. Chapin A. Harris, of Baltimore, Md.

In October, 1854, Dr. Bonwill commenced practice in Dover, Del. His experience as a cabinetmaker stood him in good stead, for he was able to make his own operating chair and all the appurtenances of his office and laboratory. Thus, "with one suit of clothes, and three dollars in his pocket," he entered upon a career in which he was destined to win fame and, if not wealth, at least a competency.

By his personal magnetism and ability, according to the standards of the day, he soon gained a considerable practice. In 1866 he graduated from the Pennsylvania College of Dental Surgery, and subsequently received the degree of M.D. from the Jefferson Medical College. In February, 1871, desiring more extensive opportunities, he removed to Philadelphia, where he speedily established himself in practice, and also devoted himself to the development of those inventions in dental mechanics upon which his reputation chiefly rests. His dental engine and electric mallet, both in crude form, were constructed in 1869; the surgical engine in 1872; the mechanical mallet in 1878. The "anatomical articulator," which he regarded as his greatest achievement and most valuable contribution to the science of dentistry, he first made in 1858, although it was not brought prominently before the profession until a much later period. The inventions above mentioned are but a few among the many which were the outgrowth of his untiring inventive skill.

Dr. Bonwill was either an active or honorary member of a large number of dental, medical and scientific societies, both in the United States and in foreign countries. He was not without honor in his own country, but his reputation was perhaps even greater abroad than at home. From several French and German societies he received decorations in recognition of his services to dentistry. By the Franklin Institute of Philadelphia he was awarded a gold medal for the originality and usefulness of his inventions.

Dr. Bonwill was married June 13, 1861, to Miss Abigail E. Warren, of Dover, Del. His three children survive him; they are Dr. Edward W. Bonwill, who has followed his father's profession and is engaged in practice in Rangoon, India; Mrs. Edward S. Gellatly, of New York City, and Mrs. Caleb J. Milne, Jr., of Philadelphia.

At this moment neither time nor space admit of extended comment upon the life and labors of one who, by his inventive talent, indefatigable industry and unquenchable enthusiasm, made himself a power in dentistry. If he had egotism, harsh criticism was disarmed by his perfect frankness; it was not the vacuous vanity of an empty and useless life, but an egotism which, when coupled with talent and industry, becomes an impelling force to great achievement.

With him disappears a picturesque and forceful personality. His faults were of the head and not the heart. Like others, he made mistakes; but, unlike some, did not hesitate to acknowledge them when convinced of error. Generous in his impulses, he was best beloved of those who best knew him. While these will mourn his loss, as will all that host of friends, to him unknown, to whom his fruitful life has been helpful, who shall say that it was not well with him when, in the fullness of his powers, if not in the full ripeness of years, amid "honor, love, obedience, troops of friends," both work and life were ended.—*Dental Brief*.

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